

PRIMA·OPTIMA·VARIA

MACHINING CENTRES

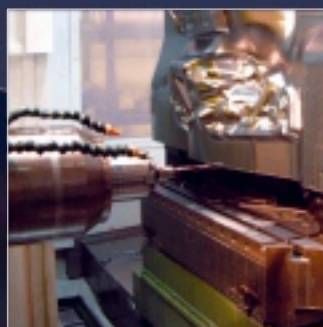
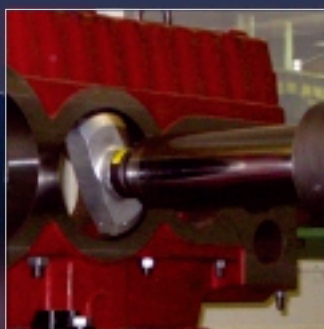


PRIMA

OPTIMA

VARIA

New goals need new solutions



ABOUT COMPANY

www.tosvarnsdorf.com

Company TOS VARNSDORF a.s. situated in Varnsdorf, Czech Republic has a years-lasting tradition in machine tool production. The company was founded, under the name of Arno Plauert Machine Works, as early as 1903 and up to now it grew up into a big engineering company, known with its products all around the world.

The company's manufacturing program is based on the development, manufacture and sale of machine tools, integrated with a wide offer of services, such as:

- training for operators and maintenance workers
- technological studies
- installations of new machines
- warranty and after-warranty (extended) servicing
- spare parts sales
- overhauls and modernizations

In addition, the company provides for the services in the form of outwork offers (Metalworking, Measuring services, Chemical and Heat Treatment of Metals).

High engineering standards of TOS VARNSDORF a. s. products were recognized in 1996 when the company was awarded the ISO 9001 certificate.



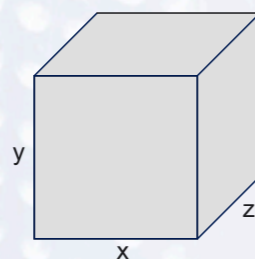
PRODUCTION PROGRAM

PRODUCTION OF MACHINE TOOLS

- HORIZONTAL MILLING AND BORING MACHINES
- FLOOR TYPE HORIZONTAL BORING MILLS
- MACHINING CENTRES
- PORTAL TYPE MACHINING CENTRES
- SPECIAL MACHINES
- ACCESSORIES

SERVICES

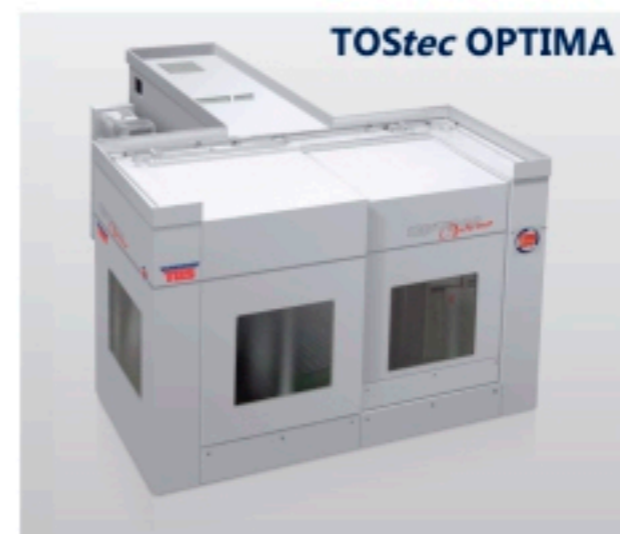
- TECHNOLOGICAL SUPPORT: TRAINING, TECHNOLOGICAL STUDIES, ETC.
- SPARE PARTS, OVERHAULS AND MODERNIZATIONS
- COOPERATION (METALWORKING, MEASURING SERVICES, CHEMICAL AND HEAT TREATMENT OF METALS)



> 1 m³ (0,01mm)

x > 1 m
y > 1 m
z > 1 m

MACHINING CENTRES TOStec



The line of TOStec machines has been designated for various levels of automatically controlled technologies, from the simplest to the most advanced procedures in the sphere of modern machining of box and board shaped products as well as products of exceptional shapes and dimensions.

This line of machines has been designed as module kit from which, by selecting the modules, a large range of machines differentiating by configuration of coordinated axis, their dimensions, equipment of headstocks for various technological purposes, by applying of automatic technological accessories and application of various types of further peripheral devices such as automatic tool or pallet change, can be created.

The new production line of TOStec milling and boring machines is targeted to the most demanding operators of the new decade, that means it features the highest parameters and wide range of technological functions which enable application of the most sophisticated tools.

THE TYPICAL FEATURES OF THE TOStec MACHINE LINE:

- modular concept providing the highest variability by means of:
 - magnitude of travel of linear adjustable groups
 - types of headstocks
 - dimensions and load of clamping tables
 - periphery of automatic tool change
 - periphery of automatic pallet change
- application of the most advanced design and equipment
- standard concept of chip and water management including the fully covered execution - high comfort of operation
- large selection of special technological accessories
- minimum requirements as to the operation and maintenance
- minimum requirements as to the preparation of the machine base

The compact fully-covered machining centres PRIMA, OPTIMA and VARIA are designated for universal and special technologies of cutting operation including the most advanced technologies of five-axes and HSC machining. A large range of travel magnitude of individual groups, various variants of headstocks and the possibility to combine individual elements between the PRIMA, OPTIMA, VARIA machines create the prerequisite for finding the ideal technical solution of whatever technological problem.

CONTENT

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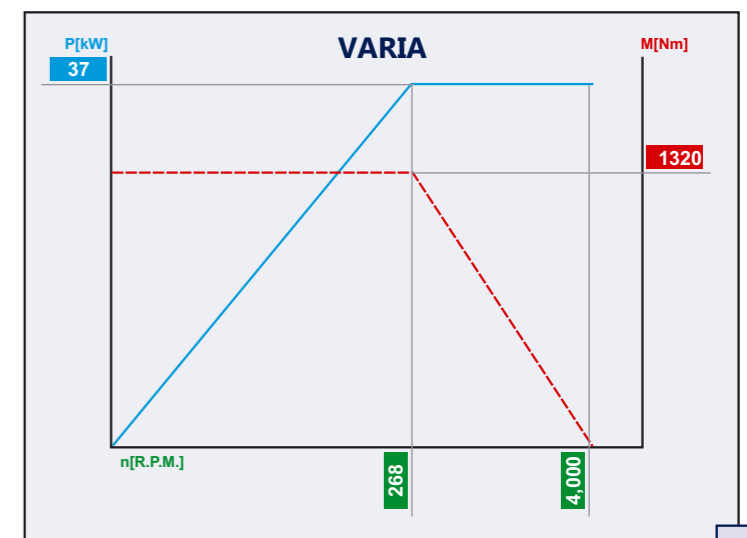
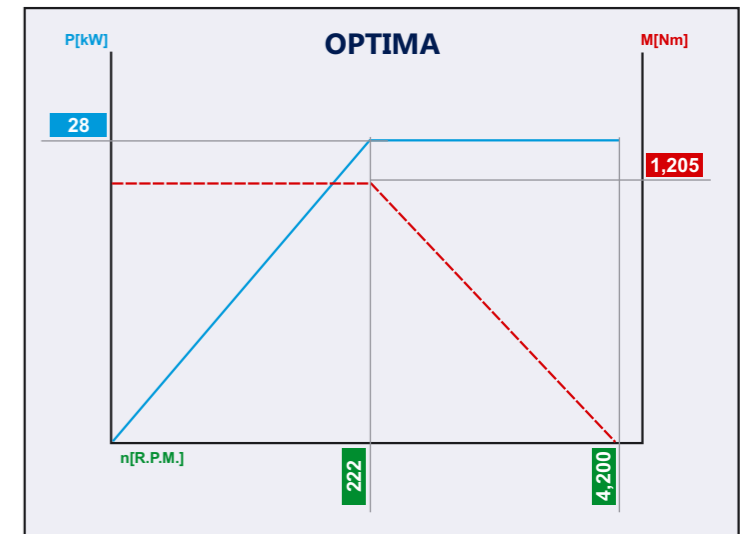
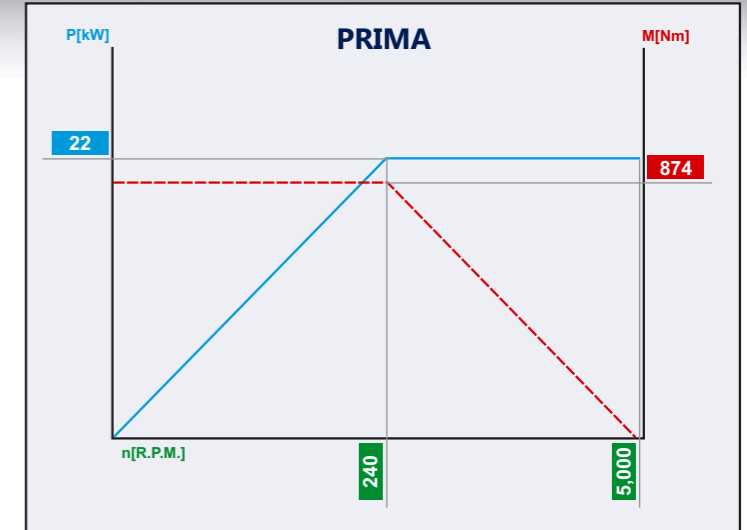
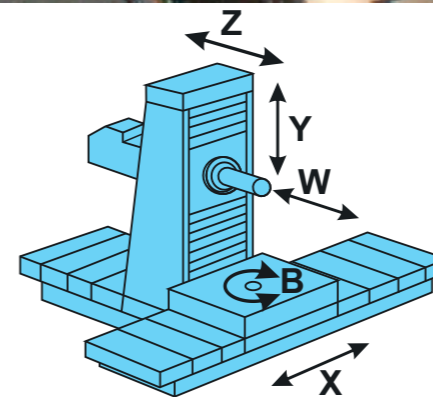
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BASIC SPECIFICATIONS

Headstock with traveling spindle	PRIMA	OPTIMA	VARIA
Spindle diameter	100 mm 3.9 inch	112 mm 4.4 inch	130 mm 5.1 inch
Spindle taper	ISO 50 / ISO 50 BIG +	ISO 50 / ISO 50 BIG +	ISO 50 / ISO 50 BIG +
Max. spindle speed	5,000 RPM	4,200 RPM	4,000 RPM
Main motor power (S1 / S6-60)	22 / 28 kW 29.5 / 37.5 HP	28 / 35 kW 37.5 / 46.9 HP	37 / 46 kW 49.6 / 61.7 HP
Spindle torque (S1 / S6-60)	874 / 1,100 Nm 644 / 811 ft lb	1,205 / 1,506 Nm 889 / 1,110 ft lb	1,320 / 1,650 Nm 973 / 1,217 ft lb
Spindle stroke W	500 mm 19.7 inch	650 mm 25.6 inch	800 mm 31.5 inch
Headstock with non-traveling			
electro-spindle	PRIMA	OPTIMA	VARIA
Spindle taper	HSK A63	HSK A63	HSK A63
Max. spindle speed	24,000** RPM	10,000* / 24,000** RPM	10,000* / 24,000** RPM
Nominal power of electro-spindle	19** kW 25.5** HP	25.5* / 19** kW 34.2* / 25.5** HP	25.5* / 19** kW 34.2* / 25.5** HP
Spindle torque max	60** Nm 44** ft lb	487* / 60** Nm 359* / 44** ft lb	487* / 60** Nm 359* / 44** ft lb
Column	PRIMA	OPTIMA	VARIA
Headstock vertical travel Y	1,000; 1,300 mm 39.4; 51.2 inch	1,300; 1,600 mm 51.2; 63 inch	1,600; 2,000; 2,500 mm 63; 78.7; 98.4 inch
Column longitudinal travel Z	1,600; 2,000 mm 78.7; 98.4 inch	1,600; 2,000; 2,500 mm 63; 78.7; 98.4 inch	1,600; 2,000; 2,500 mm 63; 78.7; 98.4 inch
Table	PRIMA	OPTIMA	VARIA
Max. loading	5 t 11,025 lbs	10 t 22,050 lbs	20 t 44,100 lbs
Clamping surface	1,000 x 1,250 mm 39.4 x 49.2 inch	1,250 x 1,250; 1,250 x 1,600 mm 49.2 x 49.2; 49.2 x 63 inch	1,800 x 1,800; 1,800 x 2,200 mm 70.1 x 70.1; 70.1 x 86.6; 70.1 x 98.4 inch
Table transverse travel X	1,600; 2,000 mm 63; 78.7 inch	2,000; 3,000 mm 63; 118.1 inch	2,000; 3,000; 4,000 mm 63; 118.1; 157.5 inch
Automatic pallet change	PRIMA	OPTIMA	VARIA
Max. loading	4 t 8,820 lbs	8 t 17,640 lbs	16 t 35,280 lbs
Clamping surface	1,000 x 1,000; 1,000 x 1,250 mm 39.4 x 39.4; 39.4 x 49.2 inch	1,250 x 1,250; 1,250 x 1,600 mm 49.2 x 49.2; 49.2 x 63 inch	1,600 x 1,600; 1,600 x 2,000 mm 63 x 63; 63 x 78.7 inch
Travel X for 2 pallets	1,600; 2,000 mm 63; 78.7 inch	2,000; 3,000 mm 63; 118.1 inch	3,000; 4,000 mm 118.1; 157.5 inch
Travel X for 3 or 4 pallets	1,600; 2,000 mm 63; 78.7 inch	2,000; 3,000 mm 63; 118.1 inch	-
Feeds	PRIMA	OPTIMA	VARIA
Feed range – X, Y, Z, W	1 - 20 m.min ⁻¹	1 - 15 m.min ⁻¹	1 - 15 m.min ⁻¹
– B	0.003 - 1.5 RPM	0.003 - 1.5 RPM	0.003 - 1.5 RPM
Rapid traverse – X, Y, Z, (W)	30 (30) m.min ⁻¹	24 (20) m.min ⁻¹	20 (16) m.min ⁻¹
– B	6.5 RPM	6.5 RPM	3 RPM

* universal operations
** finishing operations



HEADSTOCKS WITH SPINDLE ORIENTATION FEATURE



POSSIBILITY OF APPLICATION OF MILLING HEADS ONTO MACHINE

	HUI 50	HOI 50	HV/E-H
PRIMA	✓		✓
OPTIMA	✓	✓	✓
VARIA	✓	✓	✓

HUI 50

- 2-axis milling heads with automatic positioning on two planes and indexed with the use of Hirth toothing with an increment of 2.5°. Both the axes are automatically clamped. Drive by the machine spindle.

The head serves for machining of surfaces tilted in any common angle to the basic coordinate system of the machine.

	PRIMA	OPTIMA	VARIA
Installation on the machine	fixed	fixed	fixed or mounted automatically
Spindle taper	ISO 50 / ISO 50 BIG+	ISO 50 / ISO 50 BIG+	ISO 50 / ISO 50 BIG+
Max. speed	3,000 RPM	3,000 RPM	3,000 RPM
Power output	22 kW 29.5 HP	28 kW 37.5 HP	28 kW 37.5 HP
Spindle torque	770 Nm 568 ft lb	1,000 Nm 737 ft lb	1,000 Nm 737 ft lb
Clamping of axis	yes	yes	yes

HOI 50

- 2-axis "orthogonal" milling head with automatic positioning on two planes and indexed with the use of Hirth toothing with an increment of 1° / 0,001°. Both the axes are automatically clamped. Drive by the machine spindle.

The head is optimal for roughing or universal machining of areas, which are oriented in basic orientations or generally against orthogonal coordinate system of the machine. This option is necessary to discuss with the manufacturer.



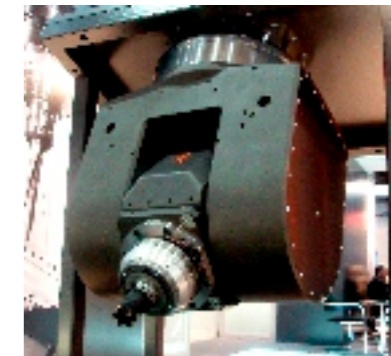
	OPTIMA	VARIA
Installation on the machine	fixed	fixed
Spindle taper	ISO 50 / ISO 50 BIG+	ISO 50 / ISO 50 BIG+
Max. speed	4,000 RPM	4,000 RPM
Power output	28 kW 37.5 HP	37 kW 49.6 HP
Spindle torque	1,070 Nm 789 ft lb	1,200 Nm 885 ft lb
Clamping of axis	yes	yes



HV/E-H

- 2-axis "fork" milling head with continuous control on two planes. Drive by the integrated electric spindle.

The head is suitable for roughing of light compositions and for finishing of work pieces from steel at positioning to the general angle (upon strengthening of both axes it provides for higher carrying capacity), also for machining of currently shaped surfaces at continuous movement of both axes of the head.



	I. TYPE	II. TYPE	III. TYPE
Installation on the machine	fixed	fixed	fixed
Spindle taper	HSK A63	HSK A63	HSK A100
Max. speed	22,000 RPM	20,000 RPM	15,000 RPM
Power output	20 kW 26.8 HP	25 kW 33.5 HP	63 kW 84.5 HP
Spindle torque	30 Nm 22 ft lb	119 Nm 88 ft lb	300 Nm 221 ft lb

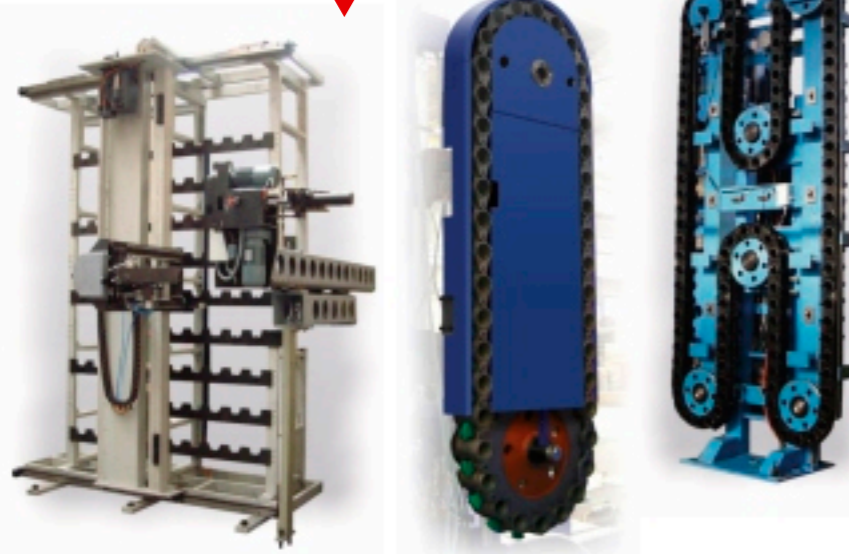
HEADSTOCKS VERSIONS WITH INTEGRATED MILLING HEADS.



TOStec - AUTOMATIC TOOL CHANGE

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LOOP MAGAZINE
CHAIN MAGAZINE
RACK MAGAZINE



Automatic tool change is, in its concept, designed as an independent structural element which consists of tool magazine and manipulator with rotating two-arm hand.

In standard execution the machine is produced for tool shanks in accordance with the norm DIN 69871/2. Based on customer's requirement the machine can be produced also for tool shanks in accordance with other norms, e.g. BT 50, CAT, HSK 100 etc.

The equipment also enables the automatic tool change into the milling heads with CNC controlled spindle position (HUI 50, HOI 50, HOF 50, HVE/H).

BASIC TECHNICAL PARAMETERS

		PRIMA	OPTIMA	VARIA
Number of storage places in magazine	- chain	40, 60		
	- loop	80, 100, 120		
	- rack	150 - 300		
FURTHER TECHNICAL DATA FOR LOOP AND CHAIN MAGAZINE				
Pitch of storage places		130 mm	5.1 inch	
Max. tool diameter	- with fully loaded magazine	125 mm	4.9 inch	
	- with free neighbouring places	320 mm	12.6 inch	
Tool length max.		500 mm	19.7 inch	
Tool weight max.		25 kg	55.1 lbs	
Tool change time		14		

TOOL MANIPULATOR

AVN (ATC) CONTROL PANEL



TOStec - AUTOMATIC PALLET CHANGE

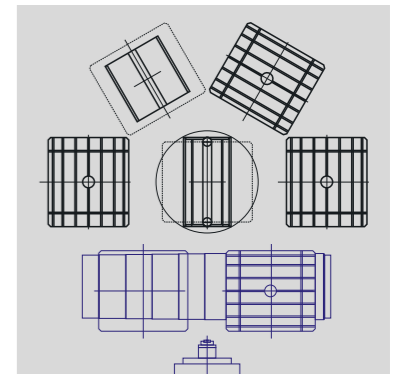
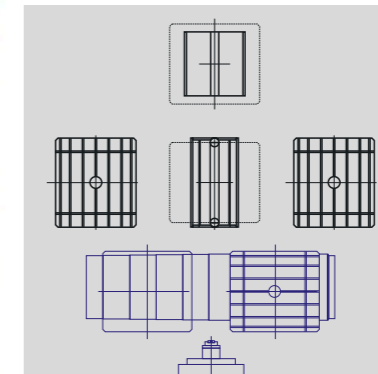
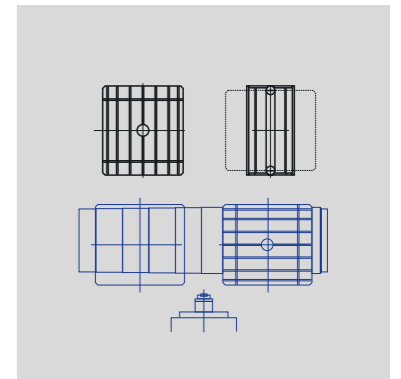


Concept of the pallet change system is based on automatic change of production pallets between pallet stations, which are equipped with pallet changing mechanism, and a pallet clamping base on the machine saddle. Pallet is arrested on the clamping base by means of two centering pins and locked by hydraulic mechanism.

Dimensions of pallet and T-slots are based on ISO standard. When two pallet system is used, pallets are changed directly between stations and the pallet base. In case 3 or 4 pallet system is used, pallets are changed by the help of rotary manipulator placed between stations and the pallet base.



AN EXAMPLE OF WORKPLACE ARRANGEMENTS FOR AUTOMATIC WORKPIECE CHANGE

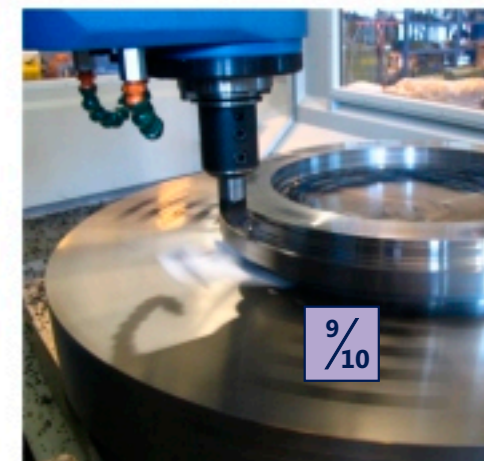


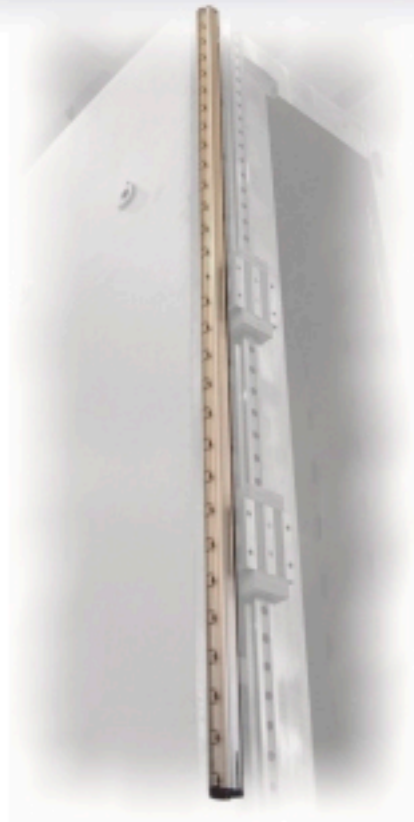
	PRIMA	OPTIMA	VARIA
Number of pallet in system (incl. stationary pallet manipulators)	2 - 4	2 - 4	2
Workpiece weight max.	4 t 8,820 lbs	8 t 17,640 lbs	16 t 35,280 lbs
Pallet clamping area	1,000 x 1,000, 1,000 x 1,250 mm	1,250 x 1,250, 1,250 x 1,600 mm	1,600 x 1,600, 1,600 x 2,000 mm
	39.4 x 39.4; 39.4 x 49.2 inch	49.2 x 49.2; 49.2 x 63 inch	63 x 63; 63 x 78.7 inch
Size of T-slots	22H8 0.87H8	22H8 0.87H8	22H8 0.87H8
Time of pallet change	80 sec	80 sec	90 sec

TABLE / PALLETS FOR TURNING APPLICATION

	PRIMA	OPTIMA
Table / pallet clamping surface	1,000 x 1,000 mm; Ø 1,250 mm	39.4 x 39.4 inch; Ø 49.2 inch
Table / pallet max. loading	4 / 2,5 t	8,820 / 5,513 lbs
Number of pallet in system	2, 3, 4	
Max. circular working feed	250 RPM	
B-axis working torque	3,000 Nm	2,213 ft lb
Max. holding torque of clamped B-axis	10,000 Nm	7,374 ft lb

Option of milling machine with higher circular working feed of table / pallet with possibility of vertical lathe-turning.





MEASUREMENT
Linear axes **X, Y, Z** are fitted with sealed direct electro-optical linear scales HEIDENHAIN.

LINEAR GUIDE
Guiding of all linear movable machine groups in axes **X, Y, Z, W** comprises of preloaded compact roller-bearing linear guideways.



DRIVE OF FEEDS
All linear axes are controlled in permanent close loop. **B** axis (rotary table) is clamped automatically by hydraulic pressure. Servodrives are AC digital made by Siemens. Spindle is driven by Siemens AC digital drive.



COLUMN
Fundamental parts of the machine (column and bed) exploit the new technology COMBItec. They are fabricated as a close ribbed welded steel structure filled by the special damping substance. This solution provides a high dynamic and static stability of machine frame and thanks to a low weight of moveable groups it enables to reach of peak values of acceleration.

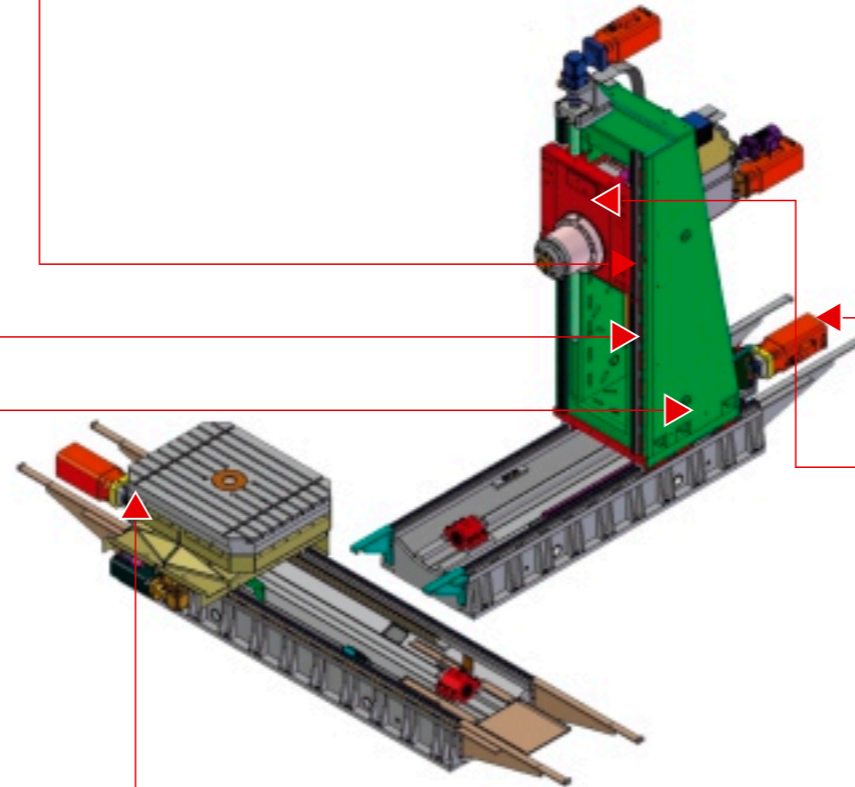
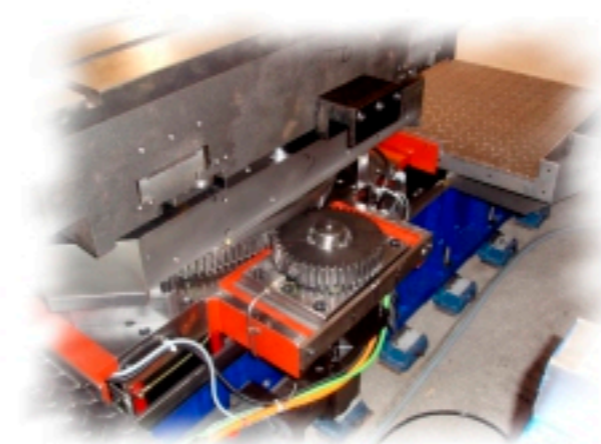
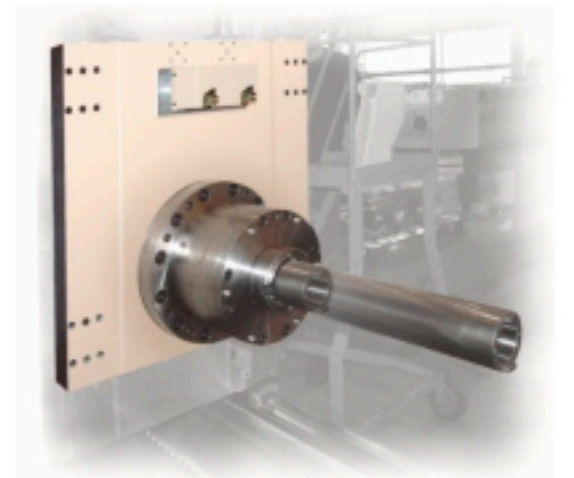


TABLE
As a standard all machines are equipped by rotary tables with controlled **B** axis. According to the customers demand it is possible to choose positioning **B** axis (drive is designed by one pinion), or continuously controlled **B** axis (drive is designed by two electronically tensioned pinions, Master-slave system).

CENTRAL HEADSTOCK
TOS tec machine are equipped with centrally guided headstock. This is the best solution from view of balanced stress of the machine skeleton by forces and thermal load.



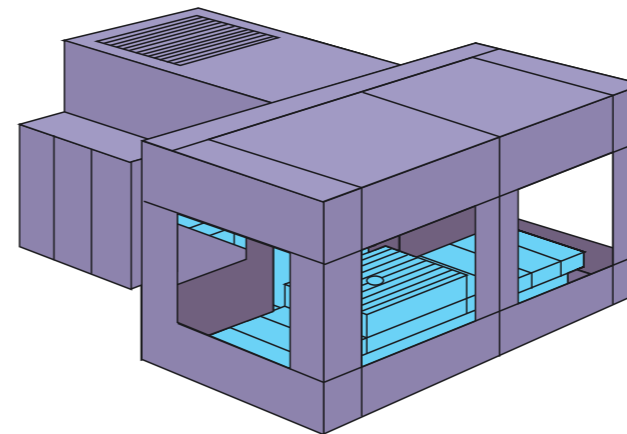
The PRIMA, OPTIMA, VARIA machines are standardly equipped with covers that ensure a high level of safety for the machine operator, protect the surroundings of the machine from flying chips and from sprayed cooling liquids and guarantee the high environment-friendliness of operations. On the customer's request we deliver these types of covers:

- COMPLETE COVERING
- 2/3 COVERING
- INDIVIDUAL COVERING



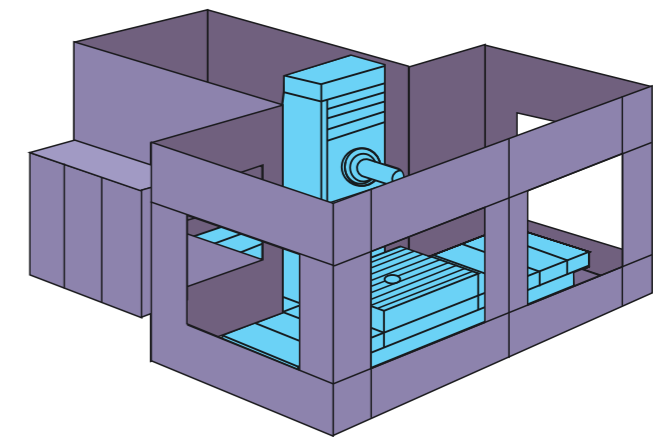
COMPLETE COVERING

Complete covering deals with water and chip management in a comprehensive way. The cooling liquid and chips are removed from the working area with the use of guiding metal sheets continuing the askew telescopic covering of the X or Z axis and other adjacent elements inclined to the chip conveyor.

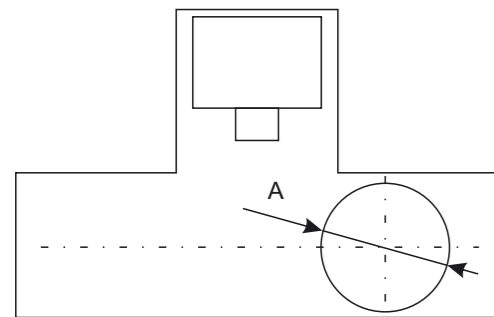


2/3 COVERING

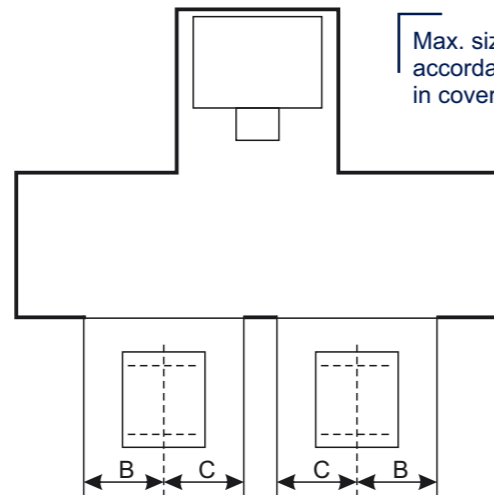
If the customer wants to process large workpieces, we deliver a standard 2/3 covering, which does not contain the roof and is lowered to exceed the top position of the spindle axis on the Y axis.



Max. size of workpiece/limiting in accordance with maximal diameter of workpiece turning-over in complete and reduced covering.

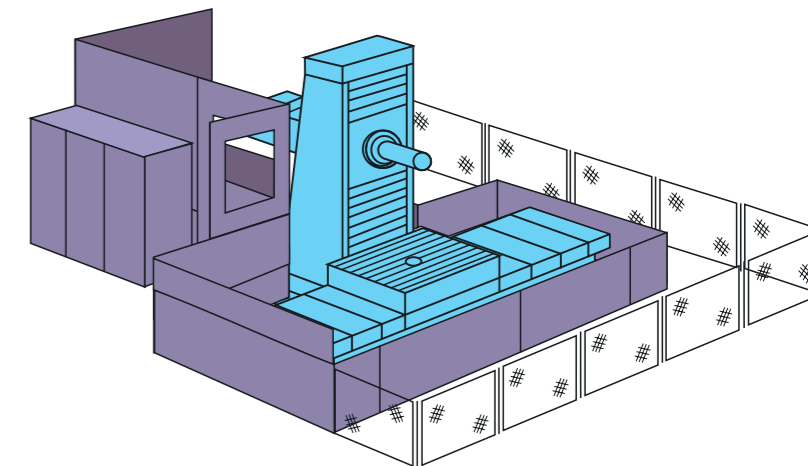


Max. size of workpiece/ limiting in accordance with opening passage in covering.



INDIVIDUAL COVERING

We also provide special covering in the event of other special requirements from customers.



PRIMA		OPTIMA		VARIA	
Clamping surface [mm] [inch]		Clamping surface [mm] [inch]		Clamping surface [mm] [inch]	
1,000 x 1,250 39.4 x 39.4		1,250 x 1,250 49.2 x 49.2	1,250 x 1,600 49.2 x 63	1,800 x 1,800 70.1 x 70.1	1,800 x 2,500 70.1 x 98.4
A = 1,500 A = 59.1		A = 2,000 A = 86.6		A = 2,900 A = 114.2	
Table cross travel X [mm] [inch]		Table cross travel X [mm] [inch]		Table cross travel X [mm] [inch]	
1,600 63	2,000 86.6	2,000 86.6	3,000 118.1	3,000 118.1	4,000 157.5
B = 750 B = 29.5 C = 650 C = 25.6	B = 750 B = 29.5 C = 750 C = 29.5	B = 1,000 B = 39.4 C = 1,000 C = 39.4	B = 1,450 B = 57.1 C = 1,000 C = 39.4		

MANUALLY OR AUTOMATICALLY APPLIED MILLING HEADS



HPR 50

The HPR 50 and HUR 50 heads are designed for manual application on the machine headstock; when used with the VARIA machine they may be applied automatically depending on the needs of the operation procedure. The heads are used for machining the surfaces that are oriented in the basic direction (also generally) with regard to the orthogonal coordinate system of the machine.



HUR 50

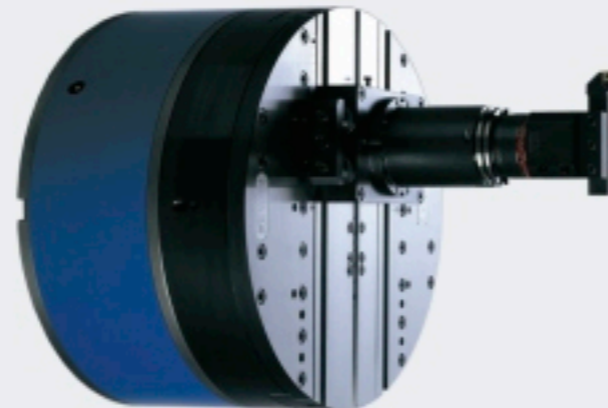
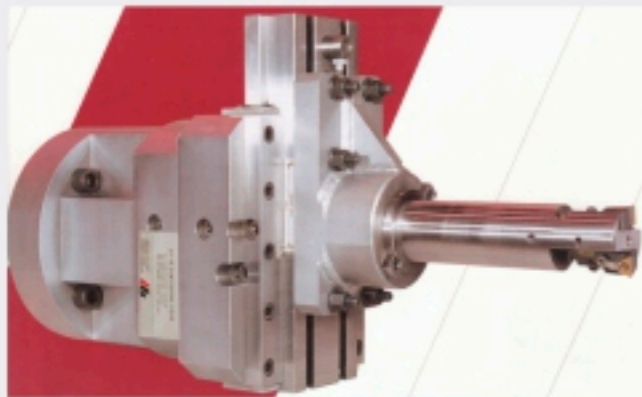
The HUI 50 head is automatically indexed on both the planes with an increment of 2.5°, providing higher efficiency during the turning of the head spindle with regard to the orthogonal coordinate system of the machine.



HUI 50

FACING HEAD

The facing head serves for facing and outside turning or boring of cylindrical, conical and otherwise shaped surfaces of large diameters. The equipment is particularly useful for the demanding technological operations where the full CNC control of the slide may be exploited.



FACING HEAD	PRIMA	OPTIMA	VARIA
D'Andrea UT3-360S - max. speed of facing head 500 RPM - slide stroke 120 mm // 4.7 inch - max. face diamet. 800 mm // 31.5 inch	manually or automatically mounted on headstock with traveling spindle		
D'Andrea UT3-500S - max. speed of facing head 315 RPM - slide stroke 160 mm // 6.3 inch - max. face diam.r 1,000 mm // 39.4 inch	-	-	manually or automat. mounted on headstock with traveling spindle
ITS 8 - max. speed of facing head 800 RPM - slide stroke 38 mm // 1.5 inch - max. face diameter 380 mm // 15 inch	manually or automatically mounted on headstock with traveling spindle		
ITS 16 - max. speed of facing head 300 RPM - slide stroke 100 mm // 3.9 inch - max. face diamet. 925 mm // 36.4 inch	manually or automatically mounted on headstock with traveling spindle		

Upon the customer's request it is possible to apply other types of facing heads or automatic mounting on the headstock.

MANUAL AND AUTOMATICALLY ADJUSTABLE MILLING HEADS	PRIMA	OPTIMA	VARIA
HPR 50 - headstock adjustable in vertical plane - max. spindle speed 3,000 RPM - maximum spindle torque 1,200 Nm // 885 ft lb	manually or automatically mounted on headstock with traveling spindle		
HUR 50 - universal - spindle orientation is adjustable in two planes - max. spindle speed 3,000 RPM - maximum spindle torque 1,000 Nm // 737 ft lb	-	manually or automatically mounted on headstock with traveling spindle	
HUI 50 - universal - spindle orientation is adjustable in two planes with increment of 2.5° - max. spindle speed 3,000 RPM - maximum spindle torque 1,000 Nm // 737 ft lb	-	-	manually or automat. mounted on headstock with traveling spindle

WORKPIECE AND TOOL PROBES

WE DELIVER THE FOLLOWING PROBES AS STANDARD:

MEASURING TOOL PROBE for the system:		
iTNC 530	HEIDENHAIN TT 140	measuring touch probe with cable transport
iTNC or Sinumerik 840D	RENISHAW TS 27 R	measuring touch probe with cable transport
MEASURING WORKPIECE PROBE for the system:		
iTNC 530	HEIDENHAIN TS 220	measuring touch probe with cable transport
	HEID. TS 640 + SE 640	measuring touch probe with optical transport
TNC or Sinumerik 840D	RENISHAW OMP 60 - set	measuring touch probe with optical transport
	RENISHAW RMP 60 - set	measuring touch probe with wireless transport
	M+H 20.41 Multi	measuring touch probe with wireless transport



The use of manually or automatically applied milling heads considerably increases the technological usability and versatility of TOStec machines.



TOS tec - OPTIONAL ACCESSORIES

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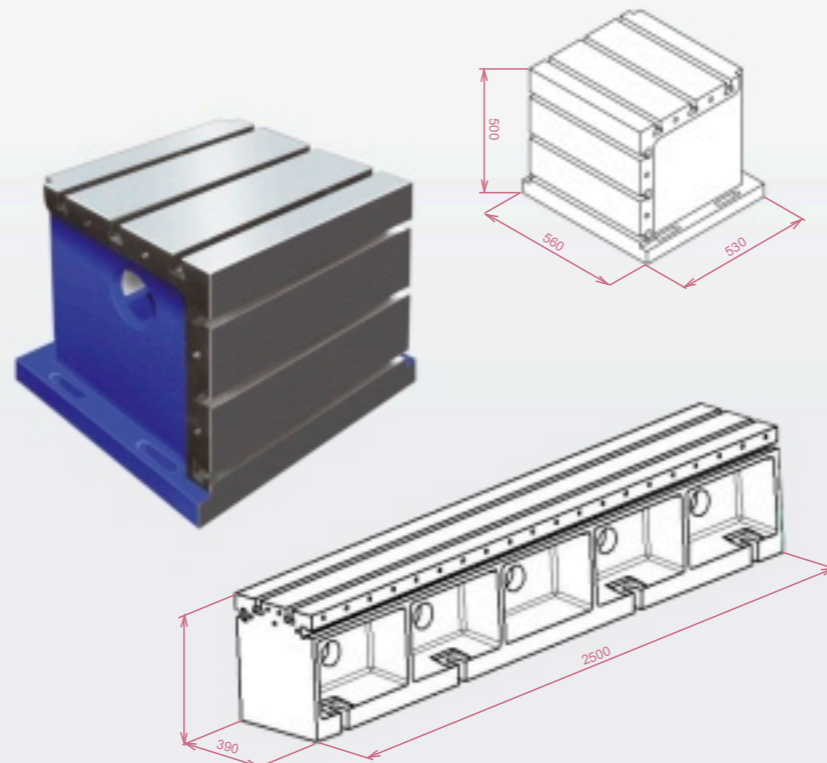
CLAMPING PLATES

The clamping plates are supplied in the following sizes as standard: 800; 950; 1,120; 1,450; 1,620; 2,000; 2,500 mm // 31.5; 37.4; 44.1; 57.1; 63.8; 78.7; 98.4 inch..



CLAMPING CUBES

UK 500, UK 1000, UK 2000, UK 2500



TOOL COOLING AND WATER MANAGEMENT



- CHZ / tool cooling with external inlet (2 nozzles) of cooling liquid including the filtration.
- CHOV / tool cooling through spindle as well as by external inlet including the filtration.

Possible choose in offer 10, 20, 30 or 40 bar. This range could be declined about 10 %. „Rinsing of telescopic covers“ /chip washing off into the conveyor from the space of telescopic splashguards of the cross bed (X) and downtake metal sheets of longitudinal bed (Z).



TOS tec - MACHINE CONTROL

HEIDENHAIN iTNC 530



SINUMERIK 840 D



The PRIMA, OPTIMA, VARIA machines are normally controlled by the HEIDENHAIN iTNC 530 or SINUMERIK 840 D control systems.

ELECTRIC CABINET

Electric outfit and other power supply units are located in electro cabinet. According to the customer's request the electro cabinet can be placed on right or left side of the machine.

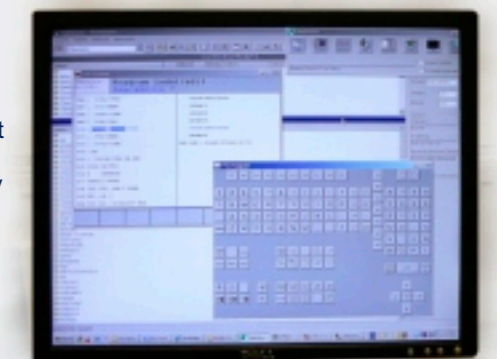


We also offer a system of services for the permanent support of customers:

TOSmessage ensures communication between the machine's control system and the customer's mobile phone. The customer is informed about the predefined statuses of the machine, e.g. the completion of an automatic cycle or possibly program interruption.

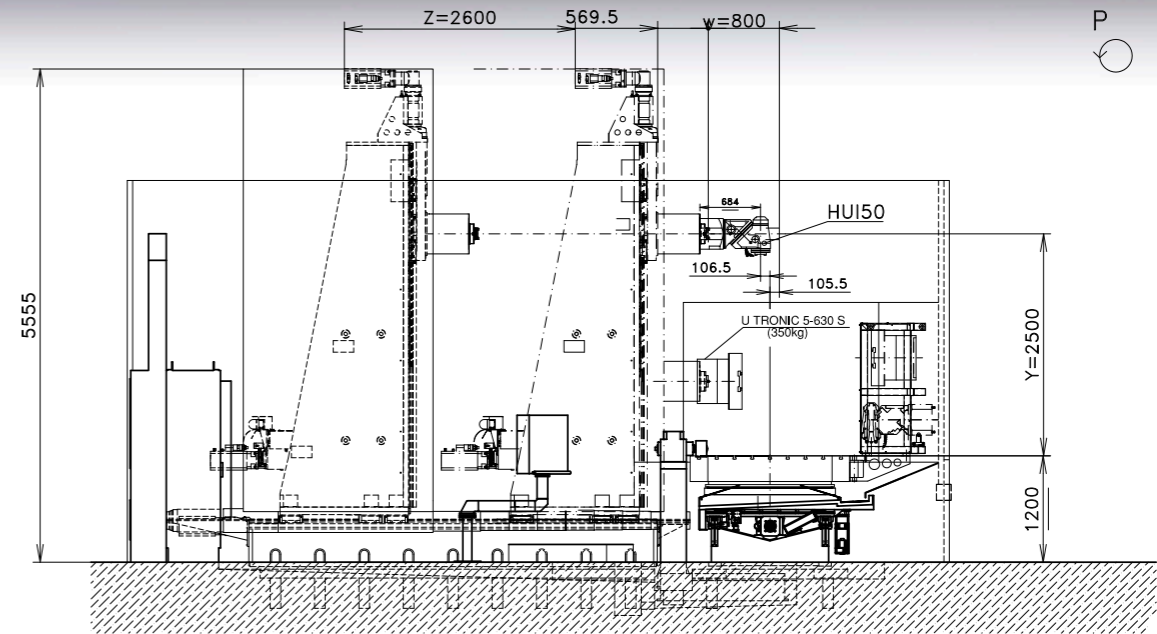
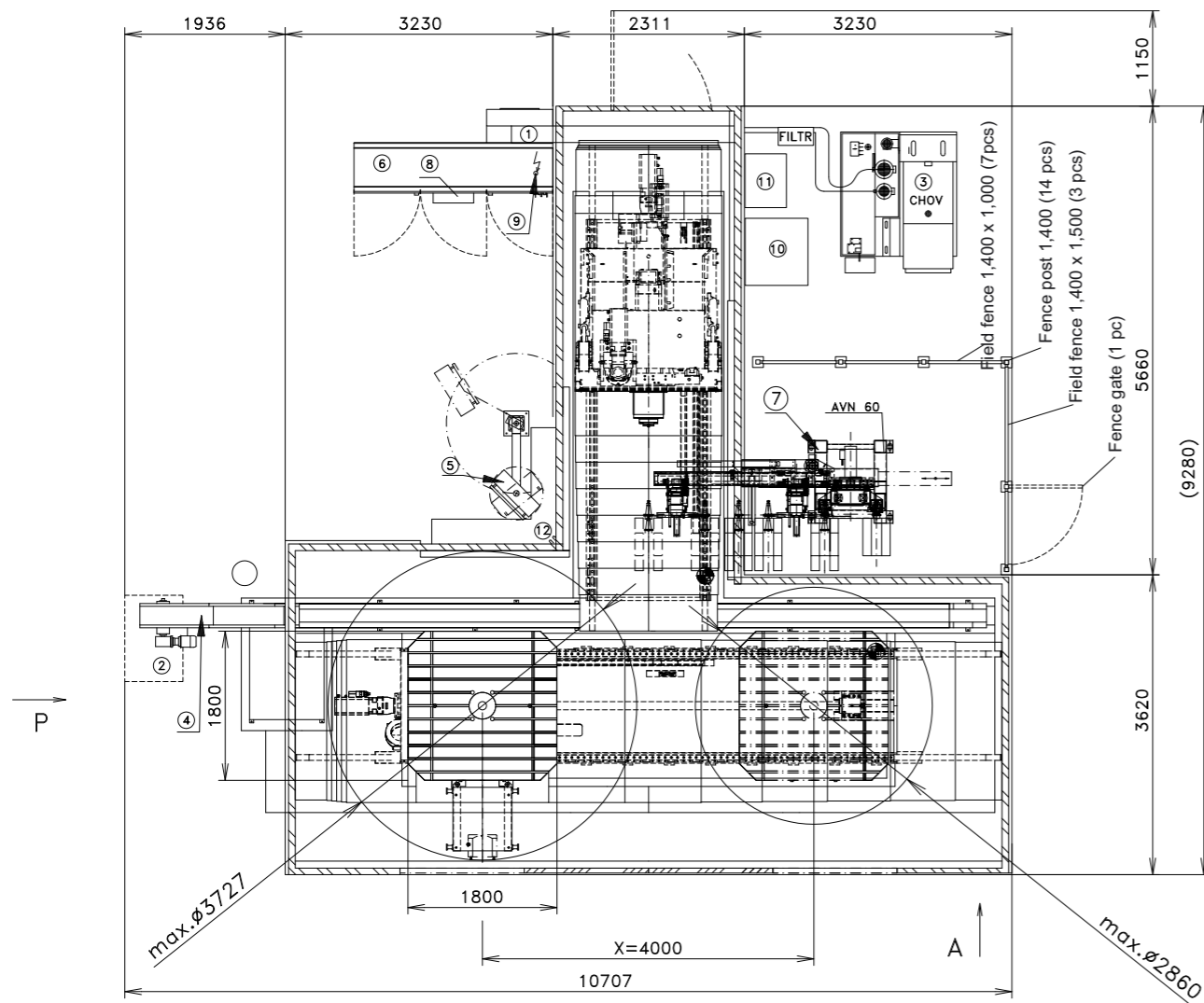
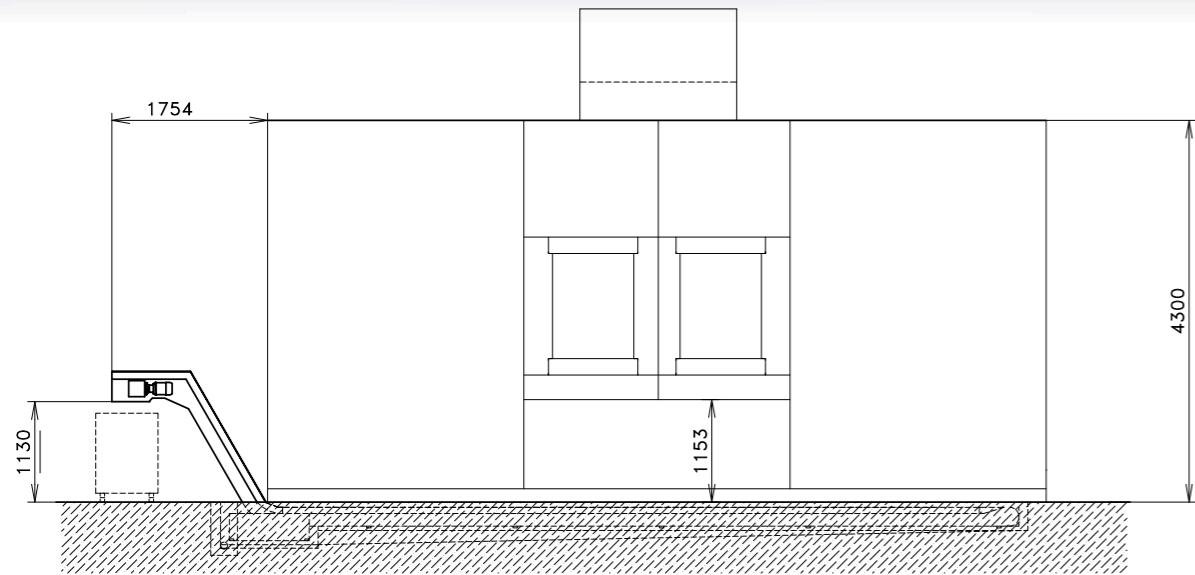


TOSwide - the remote diagnostic system allows our service engineer to obtain required data about the status of the machine necessary to specify possible diagnostic messages about the non-standard condition of the machine's control system.



i ANOTHER OPTIONAL ACCESSORIES YOU CAN FIND ON www.tosvarnsdorf.cz/en/products/accessories/

INFORMATIV MACHINE LAYOUT



1 Hydraulic pover pack	5 Control panel	9 Main cable
2 Swarf container	6 Switch cabinet	10 Chiller
3 Filtration unit	7 Automatic tool change	11 Cooling oil tank
4 Swar conveyoyr	8 Airconditioning	12 A step for access into work area

MACHINE FOUNDATION SKETCH

Percolation pit (-600)

Foundation block for the machine

Circular openings for anchoring the machine drilled after casting to the foundation block

Cable trough (-120)

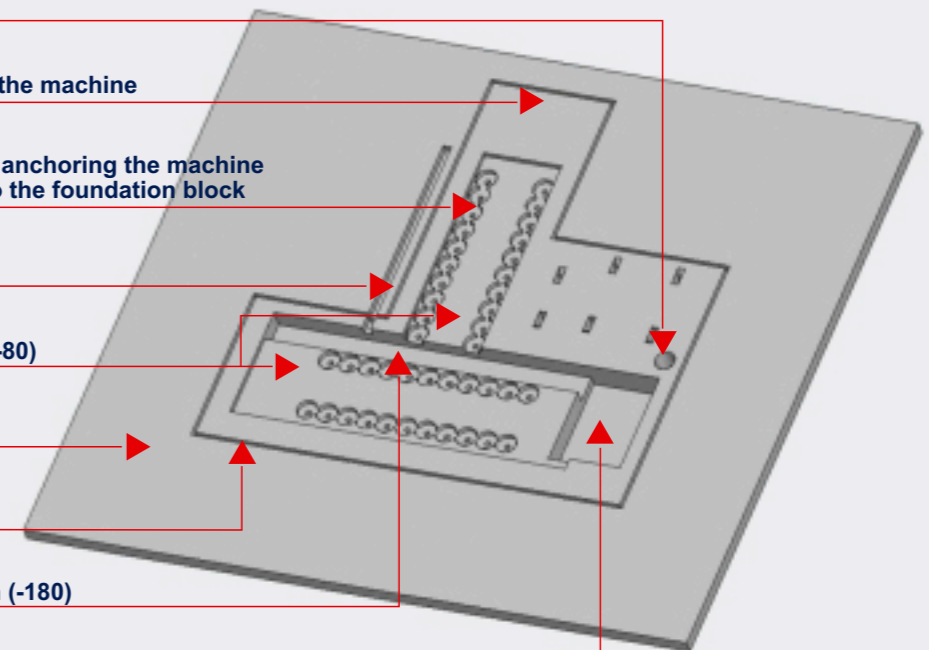
Tub for the machine (-80)

Surrounding floor (0)

Insulating gap

Chip conveyoyr trough (-180)

Tub of the chip conveyoyr tank (-420)

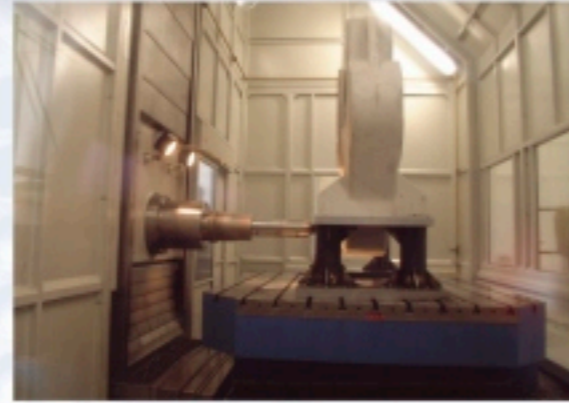




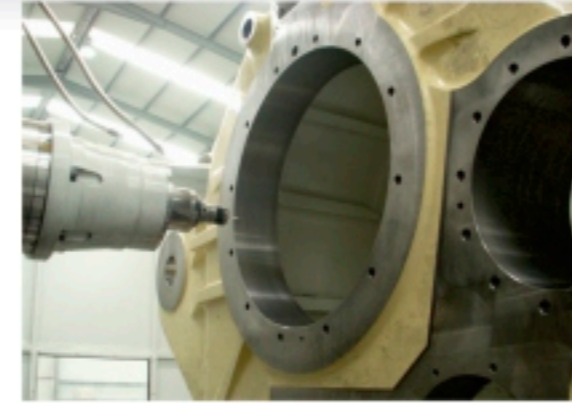
PRODUCTION OF A WORKING FOR LOGGING MACHINES



PRODUCTION OF A WORKING FOR LOGGING MACHINES



MACHINING OF A GEARBOX BODY OF A WIND-POWER STATION



MILLING AND DRILLING OF A COMPRESSOR BODY



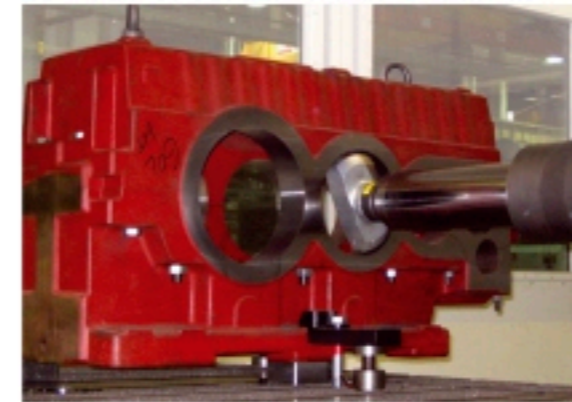
MILLING OF INCLINED SURFACES



MILLING OF AN INJECTION MOULD



MACHINING OF A GEARBOX BODY



MACHINING OF ROTOR SHAFT FOR WIND-POWER STATION



PRODUCTION OF A BUILDING MACHINE (JIB-CRANE)



MILLING OF A WORKPIECE FROM EXTRA-HARD STEEL



MORE TECHNOLOGIES YOU CAN FIND ON www.tosvarnsdorf.cz/en/technologies/

35 STATISTICS OF SOLD TOStec MACHINES OF ALL TYPES: 2003 – 2011

SORTING BY COUNTRY

	Czech Republic	15		Belgium	1
	Germany	4		China	1
	Russia	3		France	1
	Belarus	2		Poland	1
	India	2		Spain	1
	Kuwait	2		Switzerland	1
	Austria	1	Total	35	

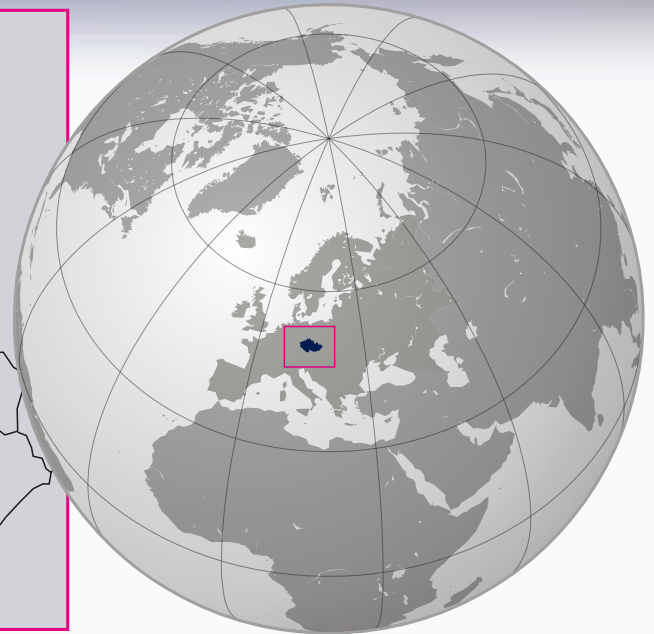
SORTING BY MACHINE TYPE

PRIMA	16
OPTIMA	8
VARIA	11
Total	35

UPON THE CUSTOMER'S REQUEST, IT IS POSSIBLE TO EQUIP THE MACHINE WITH ADDITIONAL DEVICE OR PROCES ACCESSORIES.

Data and features in the present catalogue are not binding. The producer reserves the right to alter them without advance notice at any time.

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