



RET10X

T-TYPE HORIZONTAL
BORING MILL

RETOS
VARNSDORF

www.retos.cz

RET10X – T-TYPE HORIZONTAL BORING MILL DESIGNED BY RETOS VARNSDORF

RET10X

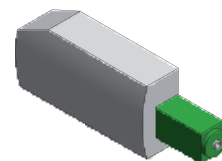
- Thanks to its unit principle, this machine excels in a maximum variability of design for various technological applications.
- According to your specific needs, you can choose between feeds in the V axis (ram) or W axis (spindle) or in both of them.
- Travel ranges in the main axes X, Y and Z, the size and number (1 or 2) of clamping plates with various functions (interpolation, positioning rotary tables, non-rotating tables) can be customized. In addition, milling heads, facing heads, ATCs and further accessories are available.

X OPTIONS

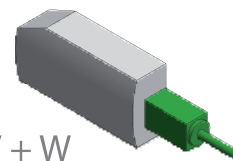
A MACHINE THAT MEETS YOUR REQUIREMENTS

HEADSTOCKS

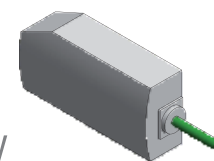
V



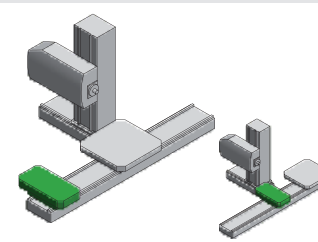
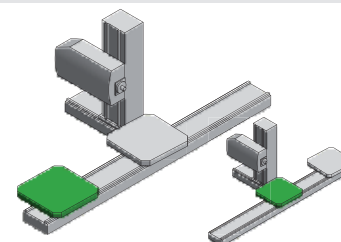
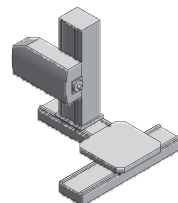
V + W



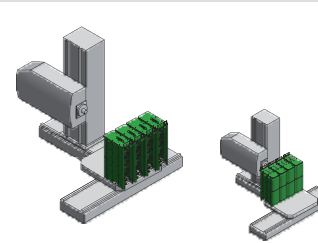
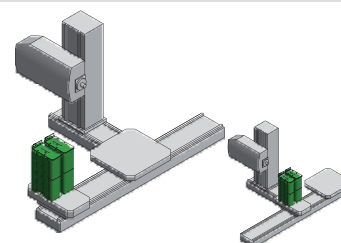
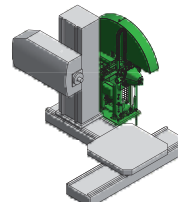
W



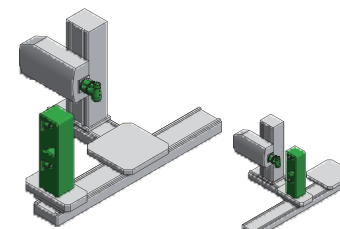
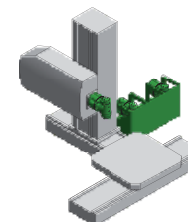
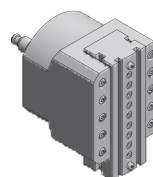
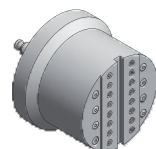
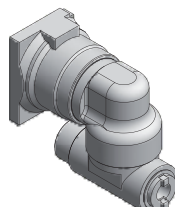
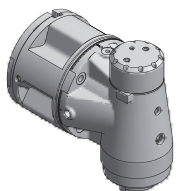
TABLES & PICK-UP



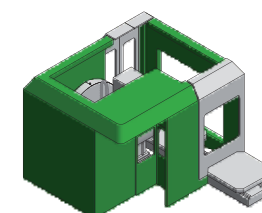
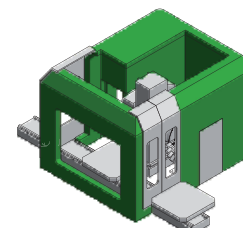
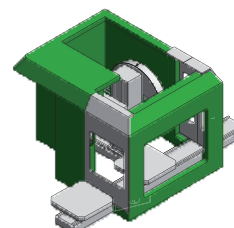
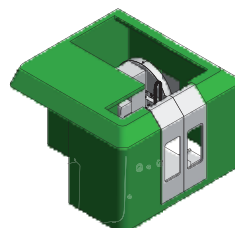
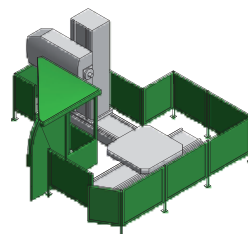
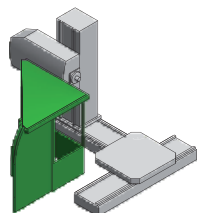
TOOL CHANGERS



HEADS



SAFETY ELEMENTS



GENERAL INFORMATION

FEATURES

- contouring T-type of horizontal boring machine
- 4 / 5 linear axes + rotary / non-rotary table
- sliding ram / workspindle or a combination of them
- machine designed for universal use in mechanical engineering production
- suitable for roughing as well as for finishing
- travel ranges, number of axes, and clamping plates (1 or 2) and the level of coverage can be customized according to your specific needs
- according to your needs, option of fitting with a broad spectrum of accessories, such as automatic tool changing systems (ATC), various milling heads and milling head changing systems (AHC), a facing head, tool cooling kit (CHZ), cooling through spindle axis (CHOV), oil-mist cooling (CHM) or swarf conveyor
- it is ready for "Industry 4.0"

CONTROLLING OF THE MACHINE

- all machine functions, except for clamping and unclamping, are controlled via the control panel, which consists of a keyboard, a switch panel and an LCD monitor
- the clamping and unclamping of tools is controlled by the key on the headstock
- the control panel is supplemented by a portable control panel (handwheel), which duplicates some of the basic control functions of the machine
- the control panel is swivellingly connected to the wall inside the operator housing
- the control system allows manual, semiautomatic and fully automatic modes
- the standard communication interface allows a connection with the Ethernet for easy administration and distribution of technological programs as well as diagnostics or servicing of the control system

STANDARD VERSION ►

CONTROL SYSTEM

- HEIDENHAIN TNC 640 + handwheel
- HEIDENHAIN drives
- SIEMENS motors

POWERED AXES

- X – travel of rotary table slide on transversal bed
- Z – travel of column slide on longitudinal bed
- Y – vertical headstock travel on column
- V – ram travel
- B – table rotation
- S – workspindle rotation

MACHINE CAPABILITIES

- interpolation controlled X, Y, Z, V axes
- B axis controlled as positioning axis
- linear interpolation
- circular interpolation
- spiral interpolation
- spacial interpolation – spline in space
- interpolation of S and Z (V) axes – spindle rotation depending on the Z (V) axis position – enables thread cutting without use of a compensating bushing
- potential limitations regarding the machine capabilities due to territorial differences in the control system's NC program



V1 HEADSTOCK

- sliding ram
- non-sliding workspindle
- spindle cavity blown with air during tool-changing cycle
- spindle driven by two speed ranges – speed reduction gear
- hydraulic shifting of each speed range
- set-up for tool cooling kit on ram front side

KINEMATICS OF THE X, Y, Z AXES

- brushless digital servomotor with servo-drive
- clearance-free gearing by timing belt
- ball screw

KINEMATICS OF THE V AXIS

- brushless digital servomotor with servo-drive
- planetary gearbox with minimum clearance
- ball screw

KINEMATICS OF THE B AXIS – V1 TABLE

- brushless digital servomotor with servo-drive
- planetary gearbox with minimum clearance
- gear ring

GROUP GUIDANCE

- X, Y, Z, V axes – Caged Roller LM Guides
- B axis – crossed roller slewing bearing

LUBRICATION

- central, axial lubrication
- frequency of lubrication cycles correlates with travelled track of the particular group

STANDARD VERSION ◀



CLAMPING

- X, Y, Z, V axes – not clamped – positional feedback
- B axis – hydraulically

HYDRAULIC POWER PACKS

- HYTOS lubrication set – lubrication of all axes
- HYTOS pressure set – unclamping of tools, fixing of B

POSITION MEASUREMENT

- X, Y, Z axes – HEIDENHAIN absolute digital optical linear encoders
- V axis – absolute rotary encoder in motor
- B axis – HEIDENHAIN absolute angle encoder
- S axis – HEIDENHAIN incremental rotary encoder

COVERAGE OF MACHINE

- X, Y, Z axes – fully enclosed groups

CE – VALID ONLY FOR THE EUROPEAN UNION

- comprehensive safety elements according to the applicable legislation and technical standards
- operator housing
- working area of the machine is fenced off

MACHINE PARAMETERS					
Tool Standard			Rotary Table – V1, V2		
Clamping taper	50	ISO	Table clamping surface	1250 x 1250	mm x mm
Tool shank	69871	DIN		1500 x 1500	mm x mm
Clamping adapter – screw	4100793	TOS		diameter 1300	mm
Headstock – V1, V2, V3			Width of T-slots	22 H8	mm
Ram cross section – width x height	315 x 380	mm x mm	Table loading capacity	8000	kg
Workspindle diameter	100 / 105	mm	Feeds of table rotation... B	** 0 -16	rpm
Spindle speed range	10 - 3500	rpm	Rapid traverse of table rotation... B	21	rpm
Main motor power (S1/S6-40%)	22 / 34	kW	** increase in speed possible if torque is reduced		
Maximum torque of the spindle (S1/S6-40%)	567 / 851	Nm	Planing Table – V3		
V... ram stroke	650	mm	Table clamping surface	1250 x 1250	mm x mm
W... spindle stroke	610	mm		1500 x 1250	mm x mm
Feeds... V, W – manual mode	4 - 500	mm / min		1500 x 1500	mm x mm
Feeds... V, W – automatic mode	4 - 10000	mm / min	Width of T-slots	22 H8	mm
Rapid traverse... V, W	13000	mm / min	Table loading capacity	8000	kg
Other Axes					
X... transversal travel of table	1000, 1250, 1500, 1750, 2000	mm	Total power consumption	65	kVA
(rapid traverse 18 m / min)	2500	mm	Machine weight – standard	11000	kg
(rapid traverse 13 m / min)	3000	mm	Total area including CE – approximate, standard	5900 x 8000	mm x mm
Z... longitudinal travel of column	1000, 1250 , 1500, 1750, 2000	mm			
Y... vertical travel of headstock	1000, 1250, 1500, 1750, 2000	mm			
Feeds... X, Y, Z – manual mode	4 - 500	mm / min			
Feeds... X, Y, Z – automatic mode	4 - 10000	mm / min			
Rapid traverse... X, Y, Z	25000	mm / min			

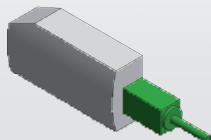
OPTIONALLY ►

CONTROL SYSTEM

- SIEMENS SIN 840D SL + handwheel
- SIEMENS drives and motors

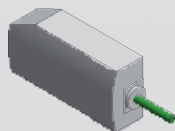
V2 HEADSTOCK

- sliding ram – V axis
- sliding workspindle – W axis
- W drive – servomotor, planetary gearbox, ball screw
- W guidance – Caged Roller LM Guides
- W clamping – not clamped – positional feedback
- W measurement – absolute rotary encoder in motor
- for further details see V1 Headstock



V3 HEADSTOCK

- non-sliding, fixed ram
- sliding workspindle – W axis
- W drive – servomotor, planetary gearbox, ball screw
- W guidance – Caged Roller LM Guides
- W clamping – not clamped – positional feedback
- W measurement – absolute rotary encoder in motor
- for further details see V1 Headstock



V2 TABLE

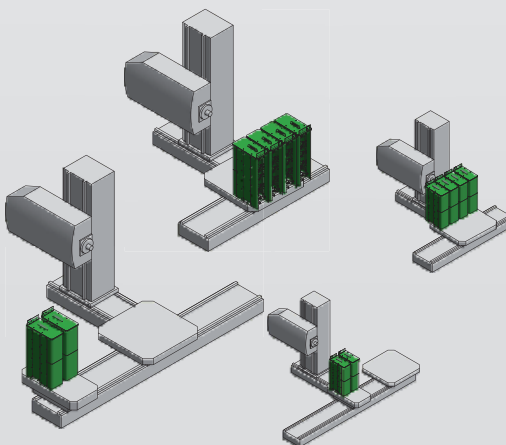
- B axis interpolation controlled
- cylindrical interpolation using the rotary table
- drive – 2 servomotors (Master/Slave), 2 planetary gearboxes, gear ring
- for further details see V1 Table

V3 TABLE – fixed planing table

2 TABLES – arbitrary combination of V1, V2, V3 Tables

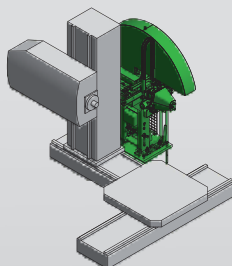
ATC R04-10 – AUTOMATIC TOOL CHANGER

- rack system on the table or pick-up
- application of several racks at various places possible
- tool changing by workspindle of the machine
- including TS 460 workpiece touch probe



ATC R03-30/40 – AUTOMATIC TOOL CHANGER

- the ATC is a separate unit
- magazine with servodrive for tool pocket positioning
- changer driven electrically / pneumatically



ATC R04-10 Parameters

Tool changing time	20	s
Number of tools in one rack	10	pcs
Maximum number of racks – table – V1, V2	4	pcs
Maximum number of racks – pick-up – fixed	2	pcs
Maximum number of racks – pick-up – rotary	4	pcs
Tool pocket pitch	130	mm
Maximum tool diameter	125	mm
Maximum tool length	500	mm
Maximum tool weight	15	kg
Weight without tools	110	kg

ATC Parameters

	R03-30	R03-40	
Tool changing time	15	15	s
Number of tools	30	40	pcs
Tool pocket pitch	130	130	mm
Maximum tool diameter – unrestricted	125	125	mm
Maximum tool diameter – with free pockets	200	200	mm
Maximum tool length	500	480	mm
Maximum tool weight	15	15	kg
Maximum weight of tools in magazine – total	250	300	kg
Maximum tool unbalance in magazine wheel	50	70	kg
Maximum wheel speed	8	5	rpm
Operating air pressure	5	5	bar
Required air purity	40	40	µm
Weight without tools	1240	1380	kg

OPTIONALLY ◀

CHZ – TOOL COOLING KIT – FLUID

- tool cooling set with jets on headstock front side
- separate cooling unit – tank with pump, level gauge, pressure test
- tank volume approx. 100 l
- maximum pressure 4 bar / 40 l/min
- set-up for tool cooling always included – distribution pipes, jets

CHZ-V – TOOL COOLING – AIR

- cold air gun
- cooling without a thermal shock
- positive impact on the accuracy and the surface quality
- high reliability
- environmentally friendly
- almost zero operating costs

CHOV-K – COOLING THROUGH SPINDLE AXIS – FLUID

- not possible to add into configuration, once the production has started
- separate cooling unit with filter and magnetic swarf separator required
- maximum pressure 40 bar – oil – tank volume 1000 l
- maximum pressure 80 bar – emulsion – tank volume 100 l
- emulsion and oil may not be used both for one machine
- other necessary alterations to machine and CE features depend on the required cooling pressure

CHOV-V – COOLING THROUGH SPINDLE AXIS – AIR

- not possible to add into configuration, once the production has started
- maximum pressure 5 bar

CHOV-M – COOLING THROUGH SPINDLE AXIS – OIL-MIST

- not possible to add into configuration, once the production has started
- separate programmable cooling unit
- maximum pressure 5 bar

CHM – OIL-MIST COOLING

- with V3 headstock only (external supply for cooling medium)
- can be added to machine at any time
- easy to install
- easy to use

SWARF CONVEYOR

- in the concrete foundation of the machine
- between the beds along the X axis

- machine design can be customized

ACCESSORIES



STANDARDLY DELIVERED ACCESSORIES

- spindle guiding support VP170 – for sliding spindle only
- VK-ISO50 cleaning brush
- clamping adapters – 15 pieces
- KM anchoring kit
- basic tool kit for operation and maintenance of the machine
- basic spares kit
- accompanying technical documentation

OPTIONAL ACCESSORIES

- spindle guiding support VP320 – for sliding spindle only
- spindle guiding support VP470 – for sliding spindle only
- HPR50, FP40 vertical manual milling head
- HUR50, UFP40 universal manual milling head
- SEMPUCO vertical and universal indexing head
- SEMPUCO universal NC milling head
- COGSDILL facing head – with V2, V3 headstocks only (spindle feed necessary)
- SHC – semiautomatic head changer
- AHC – automatic head changer
- UK500 clamping cube
- UU800, UU950, UU1120, UU1450 clamping angle plates
- spares kit for 3-year operation
- HEIDENHAIN DA 400 compressed-air filter system
- HEIDENHAIN TS 460 3D touch probe with radio / infrared signal transmission
- HEIDENHAIN HR 550 FS wireless handwheel
- HEIDENHAIN control system with options like DFX converter, collision monitoring etc.
- CE security mode 3 (for German market only)

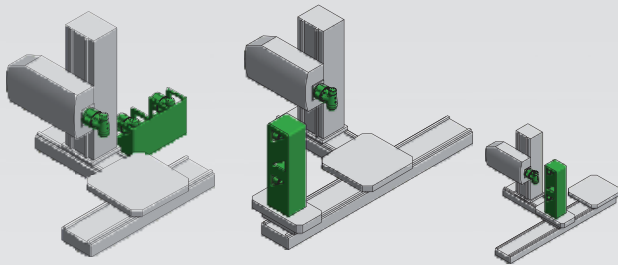
MILLING HEAD CHANGER

SEMI-AUTOMATIC MILLING HEAD CHANGING (FOR MANUAL HEADS)

- first step – crane puts head onto the table
- second step – headstock and ram put head onto the ram front
- head clamping – manually / automatically according to the head
- max. 3 milling heads

AUTOMATIC MILLING HEAD CHANGING (FOR AUTOMATIC HEADS)

- changing – headstock, ram, pick-up
- head clamping – automatically
- max. 3 milling heads
- option of combining it with the tool changer R04-10



MANUAL MILLING HEADS

HPR50 – TOS VARNSDORF

- vertical manual milling head
- hydraulic tool clamping / unclamping by means of tongues
- tool cooling through the spindle axis or by means of jets

HUR50 – TOS VARNSDORF

- universal manual milling head
- hydraulic tool clamping / unclamping by means of tongues
- tool cooling through the spindle axis or by means of jets

AUTOMATIC MILLING HEAD

KF-D2/90 – SEMPUCO

- vertical positioning milling head
- one-axis, 90°, pitch 1° or 2,5°

KFU-D2/90 – SEMPUCO

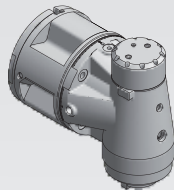
- universal, orthogonal positioning milling head
- two-axes, 90° / 90°, pitch 1° or 2,5°

KFU-D2/45 – SEMPUCO

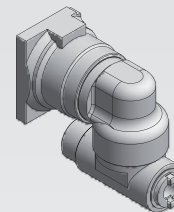
- universal positioning milling head
- two-axes, 90° / 45°, pitch 1° or 2,5°

KFU-NC2/45 – SEMPUCO

- V1 – universal milling head – dividing accuracy 5" (0,0014°)
- V2 – universal NC milling head, for NC mills
- two-axes, 90° / 45°, continuous



manual milling head
HPR50



automatic milling head
KFU-D2/90

FACING HEADS

RET10X

BASIC INFORMATION

- mechanical facing head driven by machine spindle
- slide stroke derives from work spindle stroke
- coolant supply for the tool through spindle axis
- surface quality up to Ra1,6; hole accuracy H7

ZX 200-TC – COGSDILL

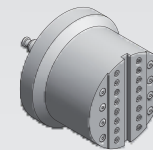
- Dmax = 500 mm; Mmax = 100 Nm; Nmax = 800 rpm; m = 107 kg
- slide stroke U axis = 38 mm

ZX 300-TC – COGSDILL

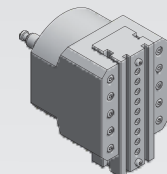
- Dmax = 800 mm; Mmax = 800 Nm; Nmax = 500 rpm; m = 168 kg
- slide stroke U axis = 75 mm

ZX 420-TC – COGSDILL

- Dmax = 980 mm; Mmax = 800 Nm; Nmax = 350 rpm; m = 175 kg
- slide stroke U axis = 102 mm



ZX-200-TC



ZX-420-TC

RETOS VARNSDORF s.r.o.

CZECH PRODUCER OF HORIZONTAL BORING MILLS WITH WORLDWIDE SALES NETWORK

The development of our new horizontal boring mills has benefitted from our long experience resulting from over 800 overhauls and modernisations. Therefore, we attach great importance to flexibility, easy maintenance, longevity and reliability of our products as well as to maximum environmental friendliness. We are a stable company founded in 1993 with about 100 motivated employees and a turnover of about 8 million €.

WE ARE YOUR PARTNER

- Production
- Service
- Sale
- Spare parts
- Consultation
- Overhauls and modernisations

PRODUCTION OF NEW MACHINES

- RET10X – CNC T-type boring mill
- RET100B – CNC table type boring mill
- RET10P – CNC floor type boring mill
- W100A – conventional table type boring mill
- customizable machine design with a wide range of technological accessories

SERVICE

- Customer service and machine maintenance during and after the warranty period with the option of a service contract
- Geometry measurement and accuracy and performance optimisation of your machine applying conventional methods as well as laser interferometers and ballbars
- Machine relocation (disassembly, transport, assembly, putting into operation)

OVERHAULS AND MODERNISATIONS

- Partial and general overhauls of RETOS VARNSDORF and TOS VARNSDORF boring mills
- CNC and conventional machine types
- Overhauled or modernised machines have technological capabilities comparable with new machines of the same category

MADE IN EUROPE

- Production and overhauls performed by experienced experts at our premises in the Czech Republic
- High-quality gray iron parts of traditional Czech production
- ISO 9001:2015 and ISO 14001:2015 certified

CONTACTS AND ADDRESS

MANAGING DIRECTOR

Ing. Jan Müller
Tel.: +420 413 039 103
E-mail: info@retos.cz

SALES

Ing. Jaroslav Dvořák / Martin Boháč
Tel.: +420 413 039 105
E-mail: sales@retos.cz

SERVICE

Petr Fritsch / Martin Boháč
Tel.: +420 413 039 101
E-mail: service@retos.cz

SPARE PARTS

Kateřina Kutová
Tel.: +420 413 039 126
E-mail: spares@retos.cz



RETOS VARNSDORF s.r.o.

Žitavská 913, 407 47 Varnsdorf, Czech Republic
IČO: 62739204 | DIČ: CZ-62739204
www.retos.cz

