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BAOJI MACHINE TOOL GROUP CO.,LTD
宝鸡忠诚机床股份有限公司
BAOJI ZHONGCHENG MACHINE TOOL CO.,LTD

BOSHI 宝鸡机床

BHR500V/700V

五轴卧式车铣复合加工中心

Machining Center

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BHR500V



01 产品概况 Product Overview

BHR500V卧式车铣复合加工中心采用卧式对列双主轴布局，上刀架为回转B轴，下刀架（选配）为卧式伺服刀架结构，机床采用高速车铣电主轴，滚柱直线导轨副，车铣刀库，机床具有5轴联动、车铣复合、高速高精度等特点。

设备用于对复杂轴类零件等精密车、铣复合加工，广泛应用于船舶、汽车、模具等制造业，特别适合能源、油气、挤出机螺杆、塑料机械、曲轴及通用加工领域，为用户提供客制化的加工方案。

BHR500V Horizontal Turning and Milling Machining Center adopts horizontal double spindle layout, the upper tool holder is rotary B-axis, the lower tool holder (optional configuration) is horizontal servo tool holder type structure, the machine tool adopts high speed turning and milling motorized spindle, roller line guideway, turning and milling tool magazine, the machine tool has the characteristics of 5-axis linkage, turning and milling combination, high speed and high precision, etc.

This equipment is used for precision turning and milling processing of complex shaft parts, etc. It is widely used in the manufacturing industry of ships, automobiles, molds, etc. It is especially suitable for energy, oil and gas, extruder screw, plastic machinery, crankshafts and universal machining fields, providing users with customized machining programs.

BHR700V



BHR700V卧式车铣复合加工中心是宝鸡机床集团有限公司采用先进研发手段开发的新产品，机床采用卧式对列双主轴布局，上刀塔为回转B轴，下刀塔为卧式动力刀塔结构，机床采用高速车、铣电主轴，滚柱直线导轨副，车铣链式刀库，机床具有5轴联动、车铣复合、高速高精度等特点。

设备用于对复杂轴类等零件的精密车、铣复合加工，广泛应用于船舶、汽车、模具等制造业，特别适合能源、油气、挤出机螺杆、塑料机械、曲轴及通用加工领域，为用户提供客制化的加工方案。

BHR700V horizontal turning and milling composite machining center is a new product developed by Baoji Machine Tool Group Co., Ltd. using advanced research and development methods. The machine tool adopts a horizontal dual spindle layout, with the upper turret being a rotating B-axis and the lower turret being a horizontal power turret structure. It adopts high-speed turning and milling motor spindles, roller linear guideway, turning and milling shared chain type tool magazine. with features such as synchronized 5 axes, turning and milling composite, high speed and precision.

BHR700V is used for precision turning and milling composite processing of complex shafts and other parts, widely used in manufacturing industries such as aerospace, shipbuilding, automobiles, molds, etc. It is particularly suitable for aviation, energy, oil and gas, extruder screws, plastic machinery, crankshafts, and general processing fields, can provide customized processing solutions for customers.





BHR500V

● 床　　身：平床身、立柱结构，通过结构优化设计，保证整机高刚性；

● 主 轴 箱：高精度主轴轴承，最高转速达4500r/min，高精度C轴驱动、制动结构，可以高速、高精车削；

● 进给系统：X、Y、Z各轴均采用伺服电机驱动滚珠丝杠传动，传递扭矩大，移动速度快，闭环控制，加工精度高；

● 加工能力：工件一次装夹完成多道工序加工，装夹误差少，生产效率高，适用于复杂零件的加工。

● 刀　　库：车铣共用24T圆盘刀库，结合下刀架（选配），提供充足的刀具安装能力；圆盘刀库，结构紧凑，换刀速度快。

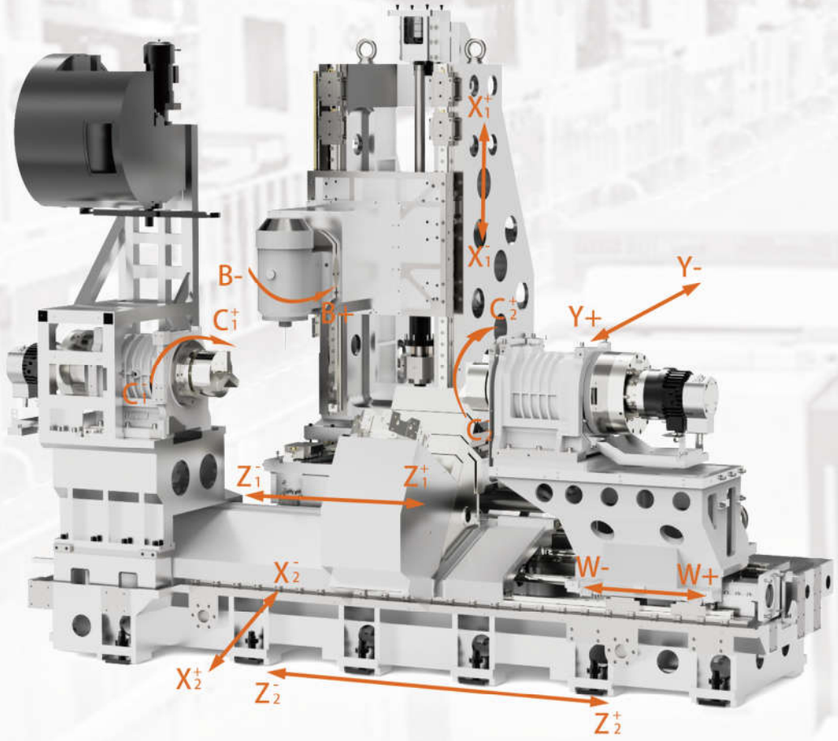
● Bed: flat bed and column structure, through structural optimization design, ensure the high rigidity of the whole machine;

● Headstock: high-precision spindle bearings, max speed up to 4500r/min, high-precision C-axis driving and braking structure, which can be used for high-speed and high-precision turning;

● Feeding system: X, Y, Z axes are driven by servo motor-driven ball screw drive, high torque transmission, fast moving speed, full closed-loop control, high machining accuracy;

● Machining capacity: the workpiece is clamped at one time to complete multi-process machining, with less clamping error and high productivity, it is suitable for machining of complex parts;

● Tool magazine: turning and milling totall 24T disc tool magazine, combined with the lower tool holder (optional configuration), to provide sufficient tool mounting capacity; disc tool magazine, compact structure, fast tool change speed.



BHR700V

● XYZBC五轴联动，车铣复合结构，左右主轴及上下刀塔组合，可实现同步、复合加工，一次装夹精密切削复杂零件，最大化提高生产率；

● 平床身、立柱结构，通过结构优化设计，保证整机高刚性；

● 采用正交设计结构，最大化Y轴加工范围；

● B轴采用滚子凸轮＋伺服电机驱动，刚性高、精度保持性好；

● 铣主轴采用内置电机驱动结构，最高转速12000r/min；

● 高精度主轴轴承，最高转速达4000r/min，高精度C轴驱动、制动结构，可以高速、高精车削；

● 直线轴采用高刚性滚柱重负荷精密级直线导轨，高精度预拉伸滚珠丝杠传动，回转轴采用转台轴承，五轴全闭环检测系统，精度保持性高，保证加工运动的高速、高精度、高刚性和高稳定性；

● 内置链式排屑器，带铁屑箱；铣主轴冷却液中心出水；

● 车铣共用40刀位链式刀库，结合12工位BMT65下刀架，提供充足的刀具安装能力；

● 铣主轴、车主轴内置电机、滚珠丝杠采用强制冷却系统；

● 导轨、滚珠丝杠副采用集中自动稀油润滑，各节点配有定量式分油器，定时定量向各润滑部位注油。铣主轴采用油气润滑。润滑系统可靠，提高了各运动副的使用寿命；

● 机床采用全封闭防护设计；可拖动旋转式操作面板、手持盒MPG使操作更加方便；

● 采用高档数控系统，机床具有坐标转换功能（数控系统功能），使编程更加简单；

● 关键零件和出厂精度均由美国布朗·夏普BROWN&SHARPE三坐标测量和英国雷尼绍RENISHAW双频激光干涉仪严格检测，对其进行全面检验，确保机床几何精度和工作精度。

● XYZBC synchronized 5 axes, turn-milling composite structure, combination of left and right spindles, upper and lower turrets, can achieve synchronous and composite processing, precision cutting of complex parts in one time clamping, maximizing productivity;

● The flat bed and column structure are optimized through structural design to ensure high rigidity of the entire machine;

● Adopting an orthogonal design structure to maximize the Y-axis machining travel;

● The B-axis is driven by a roller cam and servo motor, with high rigidity and good accuracy retention;

● The milling spindle is driven by built-in motor with a maximum speed of 12000 r/min;

● High precision spindle bearing with a maximum speed of 4000 r/min, high-precision C-axis drive and braking structure, capable of high-speed and high-precision turning;

● The linear axis adopts high rigidity roller heavy load precision linear guideways, high-precision pre-stretched ball screw transmission, and the rotary axis adopts rotary table bearings. The five axes with full closed-loop detection system has high accuracy retention. Ensure high-speed, high-precision, high rigidity, and high stability of machining motion.

● Built in chain type chip conveyor with chip cart; coolant center outlet system in milling spindle;

● Turning and milling shared 40 position chain type tool magazine, plus a lower 12 position BMT65 turret, providing sufficient tool installation capacity;

● The milling spindle and turning spindle are equipped with built-in motors and ball screws using a forced cooling system;

● Guideways and ball screws adopt centralized automatic thin oil lubrication, and each node is equipped with a quantitative oil separator, which regularly and quantitatively injects oil to each lubrication part. The milling spindle is lubricated with oil and air. The lubrication system is reliable, which improves the service life of moving parts.

03 机床数据 Machine data

BHR500V机床参数表

项目 Item		单位 Unit	BHR500V
加工范围 Capacity	床身上的回转直径 Diameter swing over bed	mm	φ600
	最大加工直径（上刀架） Max .machining diameter(upper turret)	mm	φ500
	最大加工长度 Max. machining length	mm	1000
	主轴过棒料能力 Max. bar diameter of through spindle	mm	φ65
行程 Travel	X1/X2轴 X1/X2 axis	mm	535/220（选配）
	Z1/Z2轴 Z1/Z2 axis	mm	1100/1050（选配）
	W轴(第2主轴或选配尾座) W axis(sub-spindle or tailstock)	mm	1100
	Y轴(上刀架) Y axis (upper turret)	mm	230(±115)
	B轴 B axis	deg	-30° — +210°
	C轴 C axis	deg	360°
进给 Feed	快速进给速度 X1轴 Rapid travel speed X1	m/min	48
	Z1/Y/W轴 Z1/Y/W axis	m/min	40/40/32
	B轴 B axis	r/min	40
	C1/C2轴 C1/C2 axis	r/min	80
	导轨方式 X/Y/Z/W轴 Guideway X/Y/Z/W		滚柱线性导轨 Roller linear guideway
第1主轴 Mail spindle 第2主轴 Sub-spindle	卡盘尺寸 Chuck size	inch	8
	转速 Speed	r/min	max 4500
	电机功率(额定) Motor power(Rated)	kw	17.2
	电机扭矩(额定/S6-40%) Motor power (S6-40%/Cont)	Nm	109.6/160
	分度角度(C轴) Indexing angle(C axis)	deg	0.001
	主轴鼻端 Spindle nose	-	A2-6
	主轴通孔直径 Spindle bore	mm	φ76
	主轴轴承内径 Spindle bearing bore diameter	mm	110
中心架(选配) Steady rest	夹持范围 Clamping range	mm	φ20-φ120
尾座(选配) Tailstock (optional configuration)	锥孔的形式 Tailstock taper		MT-5
	尾座轴的移动量 Travel of tailstock	mm	1100
上刀架 Upper turret	刀具形式 Tool model		HSK-A63
	B轴分度角度 B-axis division angle	deg	0.001
	B轴分度方式 B axis indexing method		直驱
	B轴分度时间 B axis indexing time	s	1/90°
	B轴最大扭矩 Max.torque of B-axis	Nm	1500
	刀具安装位置 Tool mounting position		1

项目 Item		单位 Unit	BHR500V
上刀架 Upper turret	车削刀具尺寸(外径 / 内径) Turning tool size (turning/boring)	mm	□25/40
	铣主轴转速 Milling spindle speed	r/min	max 12000
	铣主轴功率(额定/最大) Milling spindle power (rated power/max power)	kw	35/42
	铣主轴额定/最大扭矩 Rated/max. torque of milling spindle	Nm	83/100
	中心出水压力 Pressure of coolant through spindle	MPa	2.4
刀库 Tool magazine	刀柄形式 Tool shank		HSK-A63
	刀具收纳数量 Capacity of tool magazine	个	24
	刀具最大直径 Max. tool diameter	mm	φ75/φ120(无相邻接刀具) (No adjacent connectors)
	最大刀具重量 Max. tool weight	Kg	8
	最大刀具长度 Max. tool length	mm	300
下刀架(选配) Lower turret	刀位数 Tool position		8
	刀方 Tool section	mm	25
NC装置 NC device	SIEMENS 828D		828D
机床总重 Machine gross weight		Kg	13500

BHR500V机床配置表

项目 Item	型号规格 Model&Specification	BHR500V
控制系统 CNC controller	西门子系统/华中数统 SIEMENS/HNC	
副主轴 Sub-spindle	A2-6主轴头；8寸液压卡盘；4500r/min电主轴 A2-6 spindle nose; 8-inch hydraulic chuck;; 4500r/min motor spindle	●
	尾座 tailstock	○
下刀架 Lower turret	8工位/刀具尺寸：□25 8 position/Tool size:25	○
中心架 Steady rest	20-120mm夹持范围液压中心架 20-120mm clamping capacity hydraulic steady rest	○
刀具主轴 Tool spindle	12000r/min电主轴HSKT63 12000r/min motor spindle HSKT63	●
中心出水 Center effluent	2.4MPa中心出水 2.4MPa Center effluent	○
	5MPa中心出水 5MPa Center effluent	○
B、C轴 B,C axes	B、C轴直驱 B-axis , C-axis direct drive	●
光栅尺 linear encoder	五轴光栅尺（X1/X2/Y/Z1/Z2） 5 axes （X1/X2/Y/Z1/Z2）	●
防护型式 Protection guard	全防护 Full closed protection	●
排屑方式 Chip conveyor	链式排屑器 Chain type chip conveyor	●
圆盘刀库 Disc tool magazine	HSKA63X24	●
	HSKA63X32	○
主轴冷却单元 Main shaft cooling unit		●

项目 Item		单位 Unit	BHR700V 标准规格（尾座及中心架） Standard specification (with tailstock and steady rest)		副主轴规格（带下刀架） Sub-spindle specification (with lower turret)	
			1500	2500	1500	2500
加工 Capacity	床身上的回转直径 Diameter swing over bed	mm	Φ700		Φ700	
	托板上的回转直径 Diameter swing over slide	mm	Φ500		Φ500	
	最大加工直径（上刀塔/下刀塔） Max .machining diameter (upper/lower turret)	mm	Φ700/-		Φ700/Φ490	
	最大加工长度 Max. machining length	mm	1594	2594	1594	2594
	主轴过棒料能力 Max. bar diameter of through spindle	mm	Φ67		Φ67	
行程 Travel	X1/X2轴 X1/X2 axis	mm	845/-		845/270	
	Z1/Z2轴 Z1/Z2 axis	mm	1680/-	2680/-	1680/1600	2680/2600
	W轴（第2主轴或尾座） W axis(sub-spindle or tailstock)	mm	1400	2400	1570	2400
	Y轴（上刀塔） Y axis (upper turret)	mm	430（±215）		430(±215)	
	B轴 B axis	deg	-30~210		-30~210	
	C轴 C axis	deg	旋转轴 Rotary axis		旋转轴 Rotary axis	
进给 Feeding	快移速度 X1轴/X2轴 Rapid travel speed X1/X2	m/min	36		36/36	
	Z1轴/Z2轴 Z1 axis/Z2 axis	m/min	36		36/36	
	Y轴（上刀塔） Y axis (upper turret)	m/min	36		36	
	W轴 W axis	m/min	8		30	
	B轴/C轴 B axis/C axis	r/min	40/200		40/200	
第1主轴（主轴） Mail spindle	卡盘尺寸 Chuck size	inch	10″		10″	
	转速 Speed	r/min	Max. 4000		Max. 4000	
	电机功率（S6-4%/Cont） Motor power (S6-4%/Cont)	kW	26.8/20.9		26.8/20.9	
	额定/最大扭矩 Rated/maximum torque	Nm	200/330		200/330	
	分度角度（C轴）C1 Indexing angle(C axis)C1	deg	0.0001		0.0001	
	主轴鼻端 Spindle nose	-	A2-8		A2-8	
	主轴通孔直径 Spindle bore	mm	Φ82		Φ82	
第2主轴（副主轴） Sub-spindle	卡盘尺寸 Chuck size	inch	-		10″	
	转速 Speed	r/min	-		max 4000	
	电机功率（30min/Cont） Motor power (30min/Cont)	kW	-		26.8/20.9	
	额定/最大扭矩 Rated/maximum torque	Nm	-		200/330	
	分度角度（C轴）C2 Indexing angle(C axis)C2	deg	-		0.0001	
	主轴鼻端 Spindle nose	-	-		A2-8	
	主轴通孔直径 Spindle bore	mm	-		Φ82	

项目 Item		单位 Unit	BHR700V 标准规格（尾座及中心架） Standard specification (with tailstock and steady rest)		副主轴规格（带下刀架） Sub-spindle specification (with lower turret)	
			1500	2500	1500	2500
上刀塔 Upper turret (B axis)	刀具形式 Tool model		HSK-A63		HSK-A63	
	B轴锁紧分度角度 End-tooth gear indexing angle of B axis	deg	5/（任意角度） 5/(Arbitrary angle)	5/0.001	5/（任意角度） 5/(Arbitrary angle)	
	B轴分度方式 B axis indexing method		伺服电机＋滚柱蜗轮减速 Servo motor & roller worm gear reduction		伺服电机＋滚柱蜗轮减速 Servo motor & roller worm gear reduction	
	车削刀具尺寸 外径 / 内径 Turning tool size turning/boring	mm	□ 25/40		□ 25/40	
	铣主轴转速 Milling spindle speed	r/min	max12000		max12000	
	铣主轴(S6-4%/Cont) Milling spindle power(S6-4%/Cont)	kW	26/26		26/26	
	铣主轴额定 / 最大扭矩 Rated/max. torque of milling spindle	Nm	75/120		75/120	
	中心出水压力 Pressure of coolant through spindle	Mpa	Max7		Max7	
下刀塔 Lower turret	刀塔形式（车削 / 旋转刀具） Turret model(turning/living tool)		-	-	Turret(BMT-65)	
	刀具数量 Tool number		-	-	12	
	车削刀具尺寸 外径 / 内径 Turning tool size turning/boring	mm	-	-	□ 25/40	
	旋转刀具主轴速度 Living tool speed	r/min	-	-	max5000	
	旋转刀具输出功率 Living tool output power	kW	-	-	3.7	
	旋转刀具额定扭矩 Rated torque of rotary tool	Nm	-	-	8	
尾座 Tailstock	锥孔的形式 Tailstock taper		MT-5		-	
	尾座轴的移动量 Travel of tailstock	mm	1400	2400	-	
中心架（选配） Center frame (optional)	夹持范围 Clamping range	mm	Φ30-Φ245		-	
ATC	刀柄形式 Tool shank		HSK-A63		HSK-A63	
	刀具数量 Tool number		40(80、120)		40(80、120)	
	刀具最大直径 Max. tool diameter	mm	Φ90/Φ125（无相邻接刀具） Φ90/Φ125 (no adjacent tools)		Φ90/Φ125（无相邻接刀具） Φ90/Φ125 (no adjacent tools)	
	最大刀具长度 Max. tool length	mm	500		500	
	最大刀具重量 Max. tool weight	kg	12		12	
NC装置 CNC controller	SIEMENS		ONE/840D		ONE/840D	
动力源 Power source	电源/容量 Power/Capacity	V/kVA	AC3~380V±10%/120		AC3~380V±10%/120	
	电源频率 Power frequency	Hz	50±1		50±1	
	气源压力 Air source pressure	MPa	≥0.6		≥0.6	
	气源流量（ANR:标准状态） Air Source Flow(ANR:Standard State)	L	550		550	
外形尺寸 Dimensions	长×宽×高 Length×width×height	mm	7300×3580×3460	8370×3580×3460	7300×3580×3460	8370×3580×3460
净重/毛重 Net/gross weight		kg	20300/20600（标配） (Standard)	23000/23300（标配） (Standard)	20300/20600（标配） (Standard)	23000/23300（标配） (Standard)
注：此页参数为标准配置时参数，配置变更时部分参数可能会随之改变 Note:The parameters on this page are standard configuration parameters may change when the configuration is changed.						

BHR700V机床配置表 ●标配 ○选配 -没有

项目 Item	型号规格 Model&Specification	BHR700V
控制系统 CNC controller	西门子系统/华中系统 SIEMENS/HNC	
副主轴 Sub-spindle	4000r/min电主轴 4000r/min motor spindle	○
	尾座 tailstock	●
下刀架 Lower turret	BMT-65,12工位 BMT-65,12 position	○
刀具主轴 Tool spindle	12000r/min电主轴HSKA63 12000r/min motor spindle HSKA63	●
B、C轴 B,C axes	B轴减速机构、C直驱 B-axis reduction mechanism, C-axis direct drive	●
光栅尺 linear encoder	五轴光栅尺（X1/X2/Y/Z1/Z2） 5 axes （X1/X2/Y/Z1/Z2）	●
防护型式 Protection guard	全防护 Full closed protection	●
排屑方式 Chip conveyor	链式排屑器 Chain type chip conveyor	●
链式刀库 Chain type ATC	HSKA63X40	●
	HSKA63X80	○
	HSKA63X120	○
主轴冷却单元 Main shaft cooling unit		●

04 应用领域 Application field

- 能源领域：汽轮机转子轴、水轮机传动轴、发电机传动轴、风电齿轮箱传动轴等；
- 大型船用柴油机领域：凸轮轴、曲轴、连杆等；
- 其他领域：空气压缩机公转子和母转子、石油天然气行业的深孔钻头等。

- Energy field:steam turbine rotor shaft,water turbine transmission shaft,generator transmission shaft,wind power gearbox transmission shaft,etc;
- Large marine diesel engine field:camshaft,crankshaft,connecting rod,etc;
- Other fields:air compressor male and female rotors,deep hole drill bits in the oil and gas industry,etc.

适用行业：汽车、工模具、医疗器械等制造业对中小型模具、壳体类、板类、异型零件进行高精度、高速加工。

Applicable industries:Automobiles,molds,medical devices and other manufacturing industries carry out high-speed processing of small and medium-sized molds,housings,plates and special-shaped parts.



典型样件1
Typical samples 1

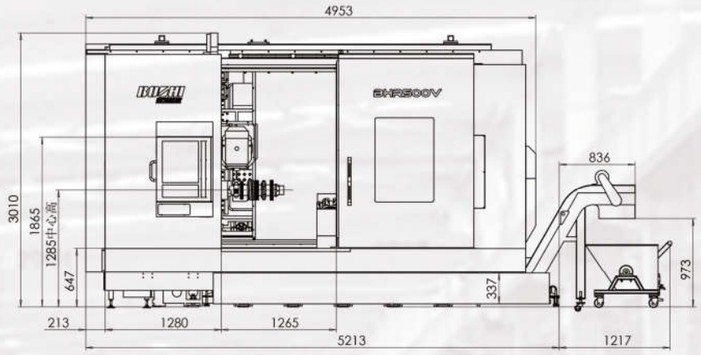
典型样件2
Typical samples 2

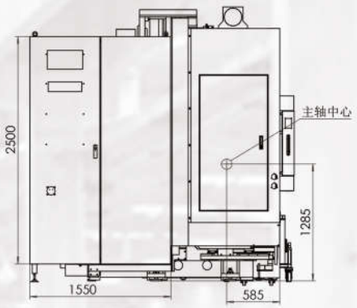


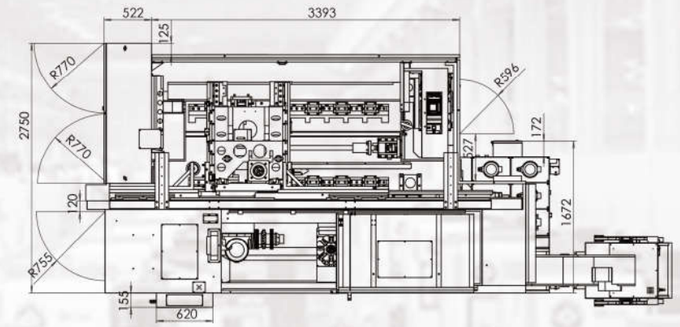


典型样件3
Typical samples 3

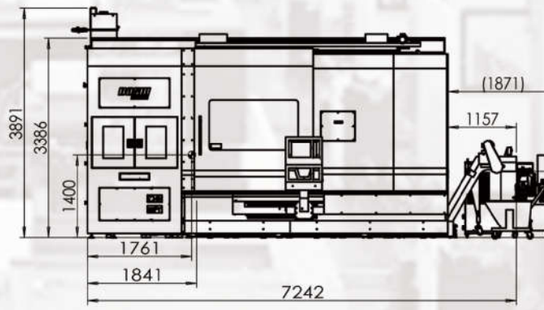
05 机床图释 Machine tool illustration

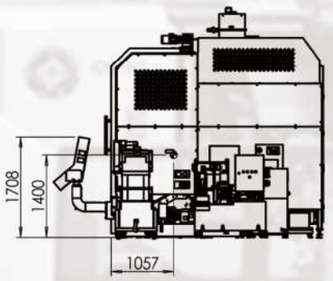


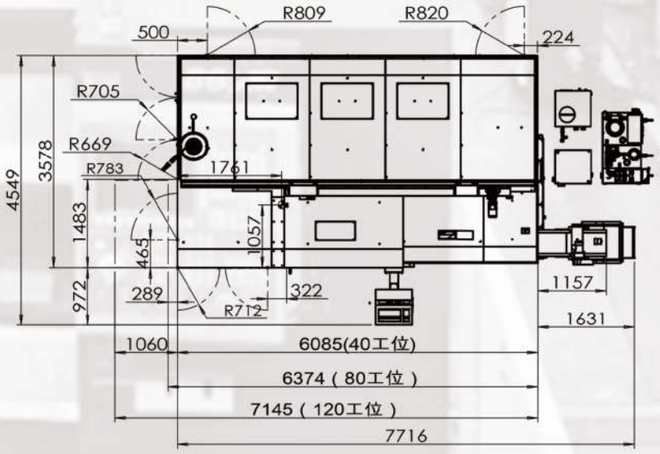




BHR500V







BHR700V(1500)