

动柱式  
加工中心  
MOBILE COLUMN  
MACHINING CENTER

**A**系列  
A SERIES



**C.B.Ferrari**

ITALIAN EXCELLENCE SINCE 1966

## 公司历史 OUR HISTORY

- 1966** 1966年9月1日 C.B.Ferrari公司在位于意大利米兰北部50公里处的瓦雷泽省莫尔纳戈成立。三位创始人分别是负责技术的Renato Bianchi先生和Giuseppe Ferrari先生，以及负责财务的Augusto Caravati先生。成立之初的目标方向是生产适用于加工冲头、模具和复杂零件的小型铣床。  
*C.B.Ferrari is established September 1st in the northern Italian town of Mornago (VA), 50 km north from Milan, by Mr. Renato Bianchi and Mr. Giuseppe Ferrari as technical members and Mr. Augusto Caravati as the financial member and begin the production of small milling machines suited to build punches, moulds and complex workpieces.*
- 1967** C.B.Ferrari 公司研发了自己的直流电机和驱动系统，并生产了第一台直流电机驱动的三轴机床。  
*C.B.Ferrari develops its own DC motors and drives, builds the first 3-Axis machine operated by DC motors.*
- 1973** C.B.Ferrari 为生产的绝大多数机床配备了数控系统并且采用了绝对测量系统。  
*C.B.Ferrari equips the majority of its machines with CNC and adopts absolute measuring systems.*
- 1974** C.B.Ferrari 发布了机床热补偿软件。  
*C.B.Ferrari releases the machines thermal compensation software.*
- 1978** C.B.Ferrari 制造了自己的第一个双摆转台和第一台五轴加工中心。  
*C.B.Ferrari builds its own first 2-Axis rotary table and builds its first 5-Axis machine.*
- 1984** C.B.Ferrari 创立了软件技术部以开发自己的CAM软件。  
*C.B.Ferrari founds Tecnosoft, its CAM software division.*
- 1985** 软件技术部发布了第一版3D CAM软件。  
C.B.Ferrari 和意大利领先的Elexa公司共同研发了第一套基于PC的数控系统。  
*Tecnosoft releases its first 3D CAM software.*  
*C.B.Ferrari develops the first PC-based CNC in Europe, in cooperation with the Italian CNC leading company Elexa.*
- 1987** C.B.Ferrari 在意大利摩德纳建立了新工厂。  
*C.B.Ferrari opens a new plant in Modena (Italy).*
- 1992** C.B.Ferrari 自主研发并生产了第一根电主轴。  
*C.B.Ferrari builds its own first electro-spindle.*
- 1993** 软件技术部发布了专门应用于透平叶片制造的CAM软件。  
*Tecnosoft releases the CAM software for turbine blades machining.*
- 1994** C.B.Ferrari 售出了第一台用于发电机叶片加工的机床。  
*C.B.Ferrari sells the first machine for power-generation blades manufacturing.*
- 1998** 软件技术部发布了用于模拟加工过程的数字仿真软件。  
C.B.Ferrari 售出了第一台用于航空发动机叶片加工的机床。  
*Tecnosoft releases the software for machining's graphical simulation.*  
*C.B.Ferrari sells the first machine for aero-engine blades manufacturing.*
- 2003** C.B.Ferrari 生产了第一台配置直线电机和力矩电机的立式五轴加工中心。  
*C.B.Ferrari builds its first vertical 5-Axis Machine equipped with linear and torque motors.*
- 2008** 软件技术部发布了用于分析和优化机床性能表现的软件。  
*Tecnosoft introduces Dynamic Analysis and Tuning software.*
- 2009** C.B.Ferrari 成立了激光技术部。  
*C.B.Ferrari establish its own Laser Division.*
- 2010** 软件技术部改进了CAM软件，使其能够适用于整体叶盘和叶轮的加工。  
*Tecnosoft develops the CAM software for IBR's (blisks) and Impellers machining.*
- 2012** C.B.Ferrari 生产了第一台配有直线电机和力矩电机的卧式五轴加工中心。  
C.B.Ferrari 和瑞士Rofin Lasag 公司在激光技术应用领域签署独家协议。  
*C.B.Ferrari builds its first horizontal 5-Axis Machine equipped with linear and torque motors.*  
*C.B.Ferrari and Rofin Lasag sign an exclusive agreement for laser application development.*
- 2013** C.B.Ferrari 开发了适用于分度凸轮加工的机床与配套软件。  
*C.B.Ferrari develop machine and software for the cam machining.*
- 2015** C.B.Ferrari 发布了专为中型叶片加工而设计的N316机床。  
*C.B.Ferrari present the new N316 model for the medium size blades machining.*
- 2016** C.B.Ferrari 发布了专为超大型叶片加工而设计的N530机床，同年售出6台。  
*C.B.Ferrari present and supply 6 machines of the new model N530, for the machining of the biggest blades in the world.*



## 公司简介 THE COMPANY

### 传统与创新

伴随着自1966年起的不断突破、创新以及坚持对性能与精度的不懈追求，C.B.Ferrari 在广泛的加工应用领域内皆游刃有余，获得了市场的肯定与信任，这奠定了其在世界上高精度五轴加工中心生产商中的领导地位。

意大利是欧洲第二大机床生产国，也是世界第五大机床生产国。目前C.B.Ferrari在意大利运营两家工厂，共有170余名积极的高技术员工，在生产高精度机床上具备丰富的经验与优秀的传统，同时自主生产包含电主轴和旋转工作台在内的绝大多数机床部件，这一切使得C.B.Ferrari能保证产品优异的质量和可靠性。

C.B.Ferrari在世界范围内安装超过4500台机床，并就近提供及时的销售和售后服务。C.B.Ferrari确保客户能够获得极高水平的技术支持，并享受业内顶尖水准的机床性能与精度。

### TRADITION AND INNOVATION

*Since 1966 constant innovation, performance based approach and market recognized and consolidated superior accuracy, achieved in a wide variety of manufacturing applications, have led C.B.Ferrari to a world leading position in high precision 5-Axes CNC machining centers solutions.*

*Currently C.B.Ferrari operates with two manufacturing facilities in Italy, the second major machine manufacturing country in Europe and the fifth in the World. 170 skilled and highly motivated employees, enjoying the homeland long-standing tradition in precision mechanics, design and manufacture all machines in house including electro-spindles and rotary tables, ensuring extraordinary quality and reliability over the time.*

*With more than 4500 machines successfully installed worldwide, supported by a complete and prompt sales and service network, C.B.Ferrari ensures its customers the ultimate manufacturing support, achieving state-of-the-art results in terms of accuracy and performances.*

# 全面服务 *SERVICES*



## 服务内容 SERVICES



C.B.Ferrari 提供广泛的技术服务，包括：

- 全球范围的销售和服务网络
- 专有主轴、分度头的制造与维修
- 顶尖的专有CAM软件和仿真模拟软件
- 交钥匙解决方案
- 机床操作示范及加工效率优化
- 精度和重复定位精度测试
- 定制自动化解决方案
- 机床大修
- 全面的技术培训



*C.B.Ferrari offers comprehensive consulting, including:*

- *Worldwide Sales and Service Network*
- *Proprietary Spindles and Dividing Heads Manufacturing and Repair*
- ***Proprietary CAM and Simulation Software products***
- *Turnkey Projects*
- *Machine Demonstration and Time Studies*
- *Accuracy and Repeatability Tests*
- *Customized Automation Solutions*
- *Used machines Overhauls*
- *Training programs*



## A 系列 - A SERIES

6

A系列机床包括一系列高速动柱式加工中心，主轴可实现三个方向上的直线运动，特别适用于透平叶片的精密加工以及航空航天、精密零件的超复杂精细加工。

系列包括4个型号，A152/56、A176、A196，都配备有垂直工作台，其主要区别在于X轴行程长度。

所有的A系列机器都可以配置连续摆动主轴头和单驱或同步双驱（相对距离可调）的多种单轴或双轴分度头，这使得该系列在同类产品竞争中能够一直保持领先。

适用于叶片加工的配置，包括一个连续摆头和两个由最新式的力矩电机同步直接驱动的分度头。第六根可选轴（B轴）可以直接实现自打中心孔。两个分度头之间的距离可调，自如应对不同长度或类型的叶片。

不论何种配置，自主生产的各式电主轴可以满足最先进的加工技术在转速，扭矩和功率方面的要求。

*The A-Series includes a full range of high-speed mobile column machining centers, with three motion linear axes, particularly suitable for precision machining of turbine blades and very complex details for the aerospace industry and precision components.*

*The range includes 4 models, A152/56, A176, A196, all with a vertical table, whose main differences relate to the slide travels range.*

*All the A-Series machines can be equipped with a tilting head and a wide range of single or double axes dividing head, in single or double synchronized slots with adjustable relative distance, that make them undisputed market leaders for flexibility and versatility in their category.*

*The specific configuration dedicated to the turbine blade machining has a tilting head and two synchronized dividing heads with Direct Drive technology, powered by the latest generation torque motors, which directly support the piece to be machined. The sixth optional axis offers the possibility to perform the bar centering directly on the machine. The distance between the two dividing heads is adjustable and allows the machining of blades of different length and type.*

*For all configurations, a wide range of electrospindles are available to meet the demands of the most advanced machining technologies for spindle speed, torque and power.*



## 产品优势 ADVANTAGES

### 紧凑的立式工作台布局

立式工作台的动柱式结构大大减少了机器的占地面积，而且更便于操作，同时确保了极佳的排屑性能。

### 刚性铸铁结构

稳定的工艺贯穿整个铸造过程，使得机床的精度得以长久保持。

### 纤细的主轴鼻端

与市面上其他产品相比，纤细的主轴鼻端减小了干涉区域大大减少了对刀柄长度的需求，即便在局促的加工空间里也确保了加工的灵活性。

### 配有力矩电机的分度头

直接驱动的分度头提高了动态性能，最大限度地提升了加工效率，尤其是叶片进、排气边。

### 用途广，柔性高

A系列两侧分度头间较大的调整距离和第6轴的选项配置使A系列成为市面上应用面最广的机床之一。

### 自动托盘交换系统

A系列可以集成自动化托盘交换系统，工件可以从机器的右侧或顶部进入工作区，而不影响操作员的视野。

### COMPACT VERTICAL TABLE LAY-OUT

The mobile column structure with vertical table lends the machine a reduced floor space need as well as an optimal access, thus ensuring an excellent chips evacuation.

### STIFF CAST-IRON STRUCTURE

The manufacturing process, together with the stabilization treatment provides the machine with precision and over time stability

### ELECTROSPINDLES WITH TAPERED FRONT

They allow the use of tools and tool holders of a significantly reduced length compared with our competitors, thus ensuring perfect machining accessibility even in reduced operating spaces.

### TORQUE MOTOR DIVIDING HEADS

The Direct Drive technology dividing heads achieve relevant dynamic performances, maximizing machining efficiency, especially at the leading and trailing edges.

### VERSATILITY AND FLEXIBILITY

The wide range of distance adjustment between the two dividing heads and the possibility to install the sixth optional axis makes the A-Series one of the most versatile machines in its category.

### AUTOMATIC PALLET CHANGE

It is possible to apply automatic pallet changer systems, which can access the working area from the right side of the machine or from the top without affecting the operator's view.



**应用一览**  
***APPLICATION SECTORS***





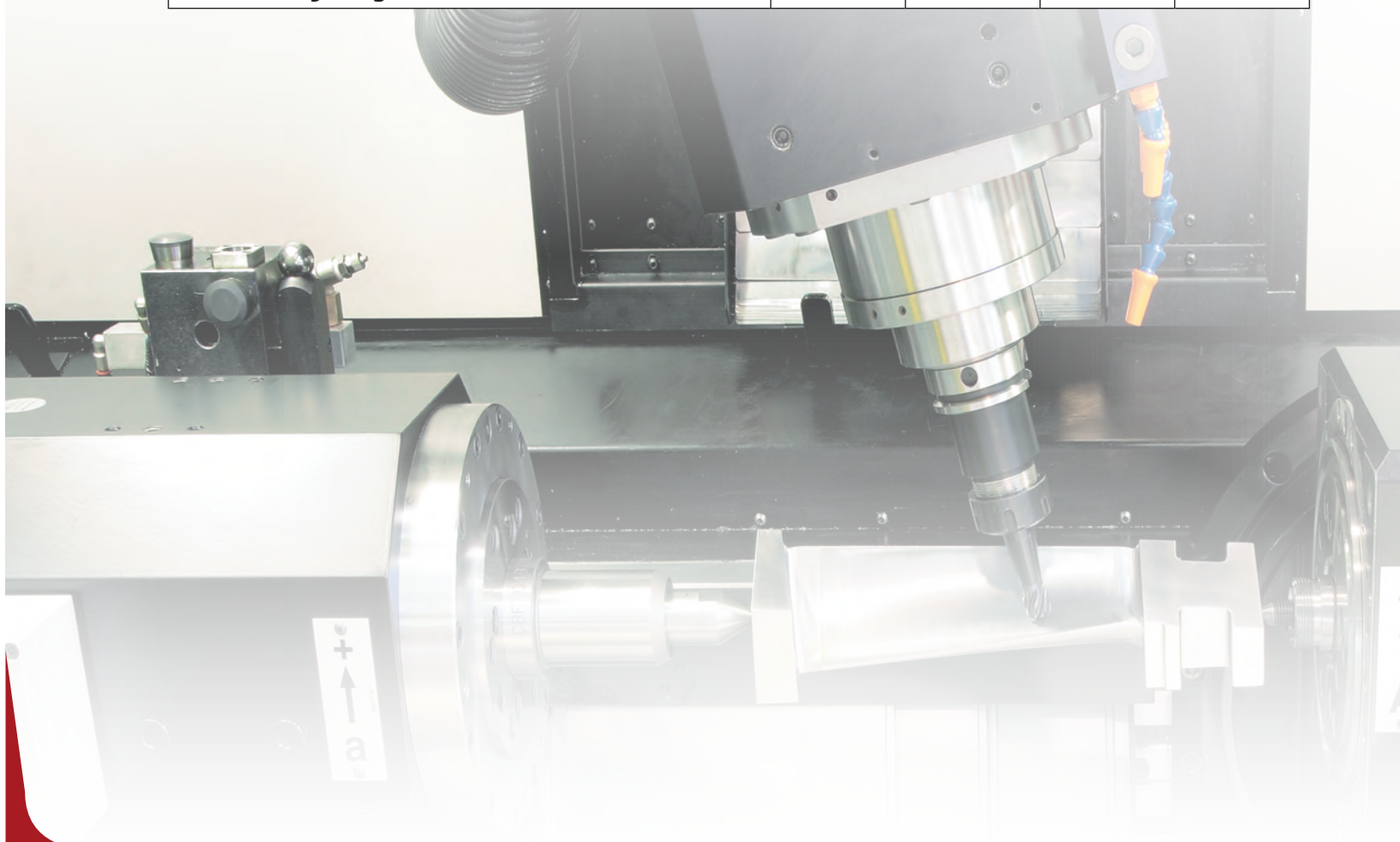
航空航天  
模具制造  
医用医疗  
透平叶片  
汽车行业  
刀具制造  
精密机械  
能源发电  
分度凸轮

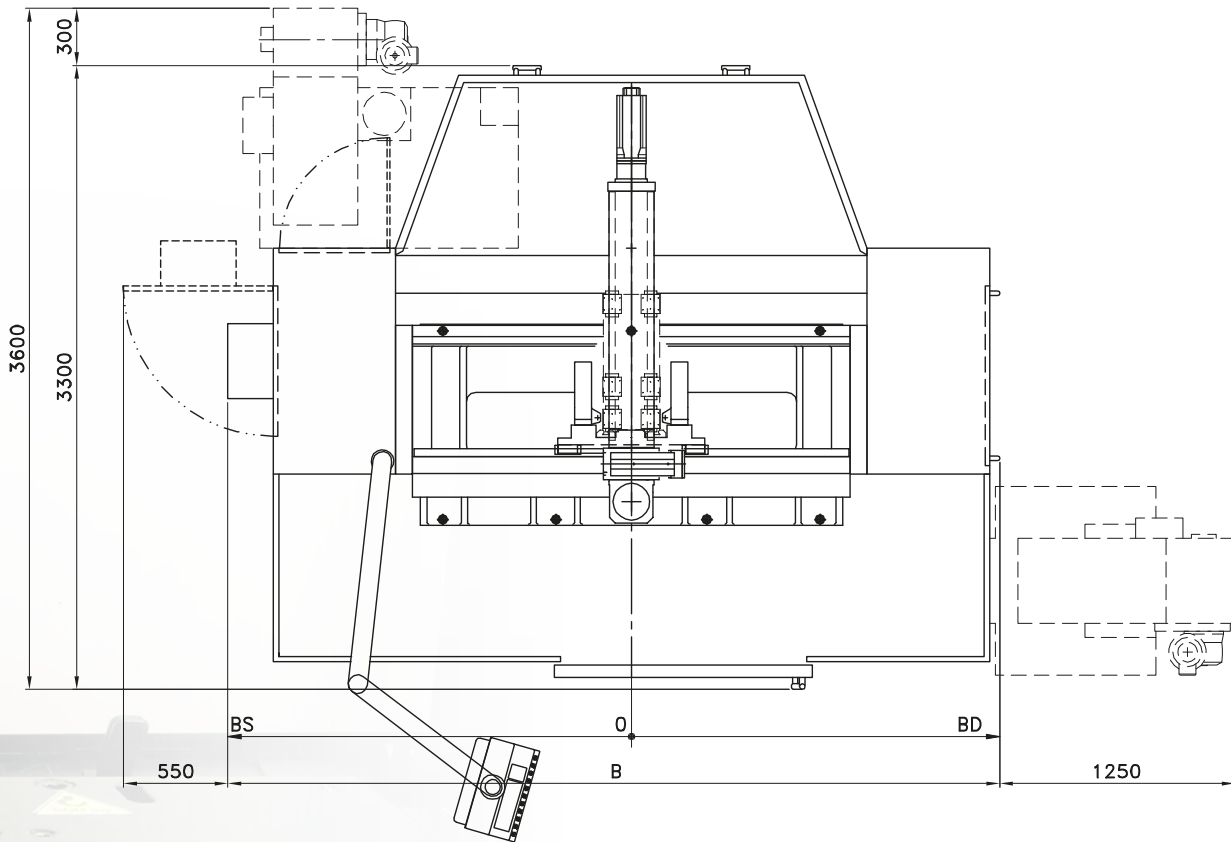
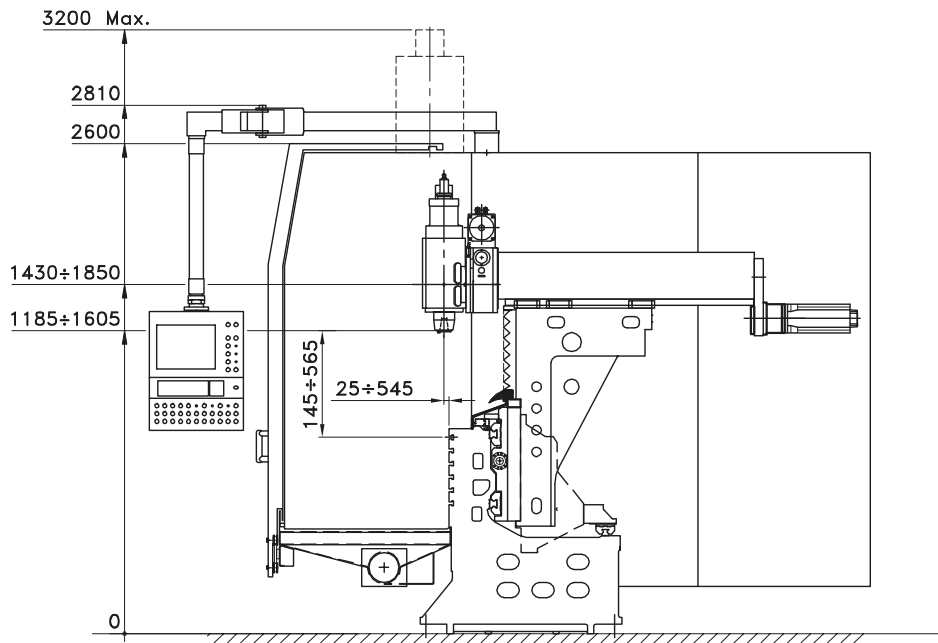
AEROSPACE  
MOULDS AND DIES  
MEDICAL  
TURBINE BLADES  
AUTOMOTIVE  
CUTTING TOOLS  
PRECISION MACHINERY  
POWER GENERATION  
CAMs



## 产品特点 FEATURES

	A152	A156	A176	A196
<b>行程 • SLIDE TRAVELS</b>				
X - 轴 <i>Longitudinal</i> (mm)	850	850	1050	1620
Y - 轴 <i>Cross</i> (mm)	420	520	520	520
Z - 轴 <i>Vertical</i> (mm)	420			
<b>测量系统 • MEASURING SYSTEM</b>				
绝对光栅尺 <i>Absolute optical linear scales</i>	Heidenhain			
绝对编码器 <i>Absolute encoders</i>				
<b>轴 • AXES</b>				
XYZ 进给速度 <i>Feed rates XYZ</i> (m/min)	40-40-30			
XYZ 进给速度 (可选 <i>Feed rates XYZ</i> (m/min) option)	48-48-45			
轴推力/扭矩100% ÷ 最大轴推力/扭矩 <i>Axes thrust/torque at 100% ÷ Axes thrust/torque (Nm)</i>	7000 ÷ 14000 (XY) 11000 ÷ 22000 (Z)			
<b>丝杠 • SCREWS</b>				
φ/螺距 <i>Ø/Pitch</i> (mm) X	40/20	40/20	40/20	50/25
φ/螺距 <i>Ø/Pitch</i> (mm) YZ	40/20			
<b>尺寸与重量 • DIMENSIONS AND WEIGHTS</b>				
有防护尺寸 <i>Measures for passage</i> (m)	2,40 x 2,80 h			
无防护尺寸 (m) <i>Passage with disassembled guarding</i> (m)	1,75 x 2,80 h			
净重 <i>Net weight</i> (kg)	8000	8000	8500	10000





	<b>BD</b>	<b>BS</b>	<b>B</b>
<b>A152</b>	1650	1850	3500
<b>A156</b>	1650	1850	3500
<b>A176</b>	1750	1950	3700
<b>A196</b>	2050	2250	4300

机床布局  
**A系列**  
**A SERIES**  
 MACHINE  
 LAYOUT

## 电主轴 *ELECTROSPINDLES*

C.B.Ferrari 所有机床配备自主设计并制造的电主轴,可以为其用户提供以下卓越的优势:

- 库存有充足的备用电主轴
- 响应时间短且主轴易于更换
- 低廉的维修费用
- 减少机床停机时间

陶瓷球轴承

集成同步电机

温度控制功能

液体冷却系统

刀具轴向热变形自动补偿

可倾电主轴的摆动可为机械驱动或力矩电机驱动 (选配)

*C.B.Ferrari design and manufactures in house all the electrospindles its machines are equipped with, offering remarkable advantages to its customers:*

- *Spare spindles always available*
- *Easy replacement with minimum intervention time*
- *Low repair cost*
- *Reduced machine downtime*

*Ceramic ball bearings*

*Integrated synchronous motor*

*Temperature controlled operation*

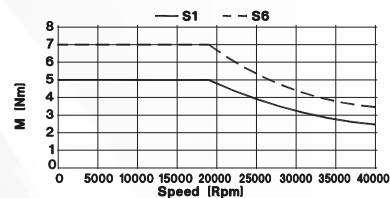
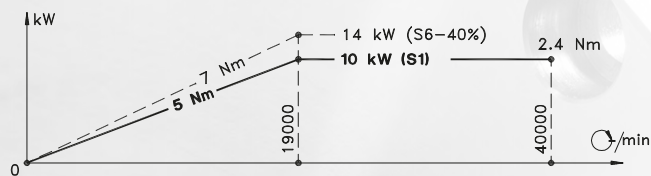
*Liquid cooling system*

*Automatic compensation of thermal expansion along the tool axis*

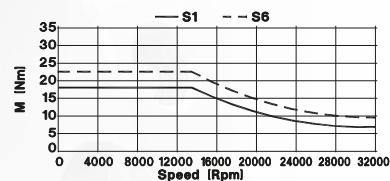
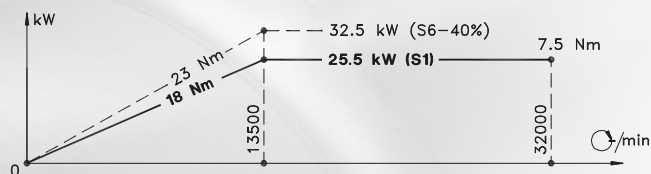
*The tilting of the head can be mechanical or torque (optional)*

40.000 RPM	HSK E40	10/14 Kw	5/7 Nm	Type 051555
28.000 RPM	HSK E40	25,5/32,5 Kw	18/23 Nm	Type 051553
24.000 RPM	ISO V40	30 Kw	42/59 Nm	Type 050486
24.000 RPM	IHSK A63	30 Kw	42/59 Nm	Type 050488
20.000 RPM	ISO V40	28 Kw	63/83 Nm	Type 051556
20.000 RPM	HSK A63	28 Kw	63/83 Nm	Type 051557
16.000 RPM	ISO V40	33 Kw	105/140 Nm	Type 050477
16.000 RPM	HSK A63	33 Kw	105/140 Nm	Type 050478
16.000 RPM	HSK A63	52 Kw	150/240 Nm	Type 051577
9.000 RPM	ISO V40	31/42 Kw	130/175 Nm	Type 050498
9.000 RPM	HSK A63	31/42 Kw	130/175 Nm	Type 050499

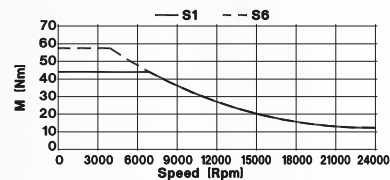
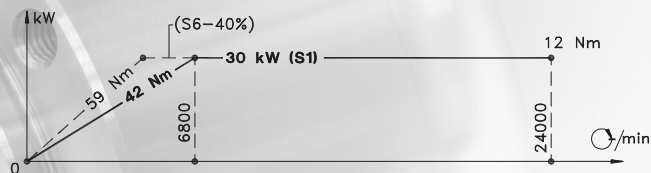
40000 rpm  
10/14 kW  
5/7 Nm



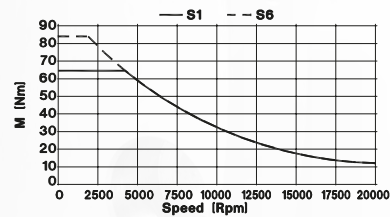
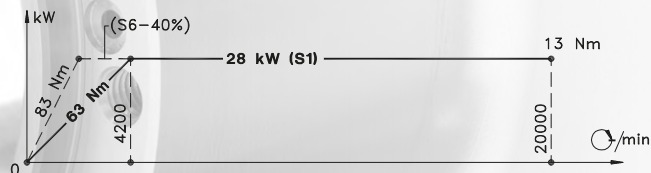
32000 rpm  
25.5/32.5 kW  
18/23 Nm



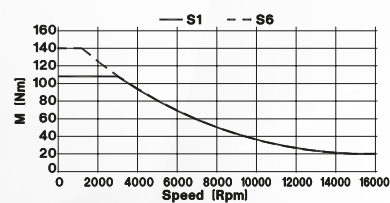
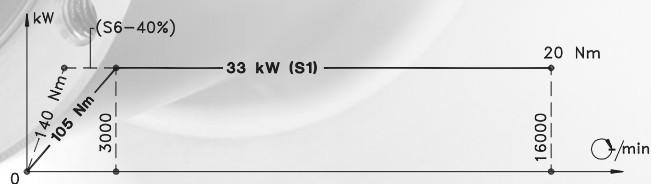
24000 rpm  
30 kW  
42/59 Nm



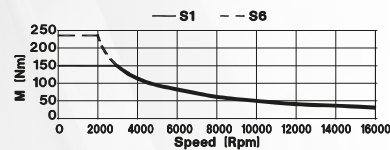
20000 rpm  
28 kW  
63/83 Nm



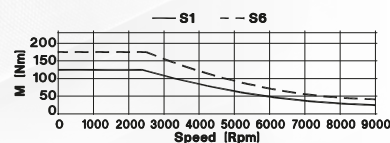
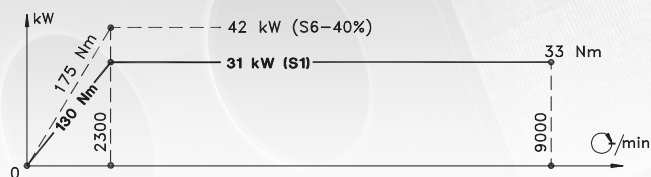
16000 rpm  
33 kW  
105/140 Nm



16000 rpm  
52 kW  
150/240 Nm



9000 rpm  
31/42 kW  
130/175 Nm



## 选配件 ACCESSORIES

### 矩形工作台 SQUARE TABLES

型号 TYPE	装夹范围 Clamping area (mm)
1561	1050x450
1761	1250x560
1762	2000x560

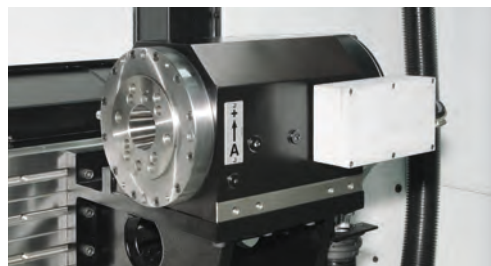
最大载荷 1500 kg

Allowed weight on the table 1500 kg



### 1轴分度头 (右端) 1 AXIS DIVIDING HEAD (right)

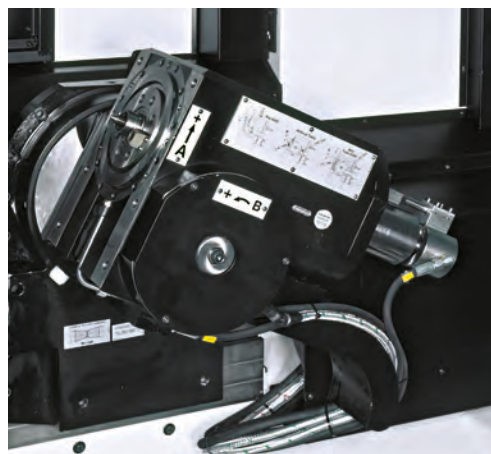
型号 TYPE	
O43172	200 RPM - 300 Nm - ISO 50
O43173	200 RPM - 500 Nm - ISO 50
O43174	200 RPM - 500 Nm - $\phi$ 100
O43175	200 RPM - 300 Nm - $\phi$ 100



14

### 2轴分度头 (右端) 2 AXES DIVIDING HEAD (right)

型号 TYPE	
O43232	A= 200 RPM - 300 Nm - ISO 50(机械结构 mechanical) B= 10 RPM - 1400 Nm
O43200	A= 200 RPM - 300 Nm - ISO 50 B= 10 RPM - 1400 Nm
O43201	A= 200 RPM - 300 Nm - $\phi$ 100 B= 10 RPM - 1400 Nm
O43210	A= 200 RPM - 300 Nm - ISO 50 定角 INDEX B= 0°-45°-90°
O43211	A= 200 RPM - 300 Nm - $\phi$ 100 定角 INDEX B= 0°-45°-90°

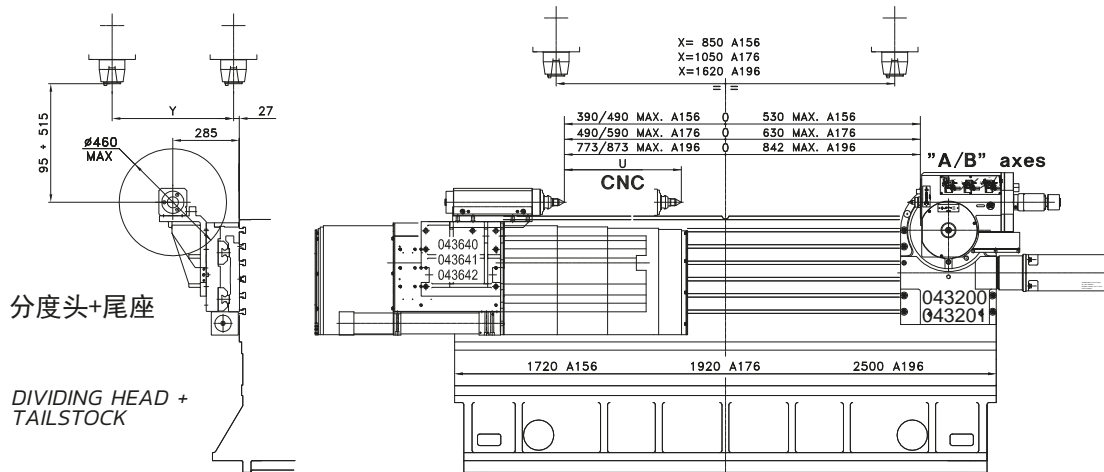
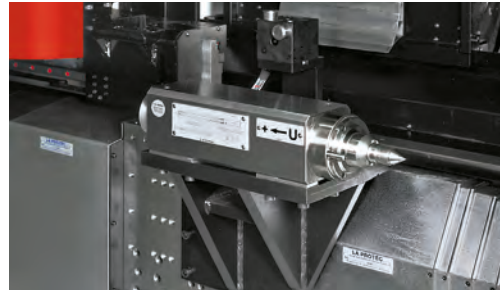


# 数控滑座 CNC AUTOMATIC SLIDE

## M4旋转尾座 WITH M4 ROTARY TAILSTOCK

行程 TRAVEL (mm)

A152/156	500
A176	600
A196	800

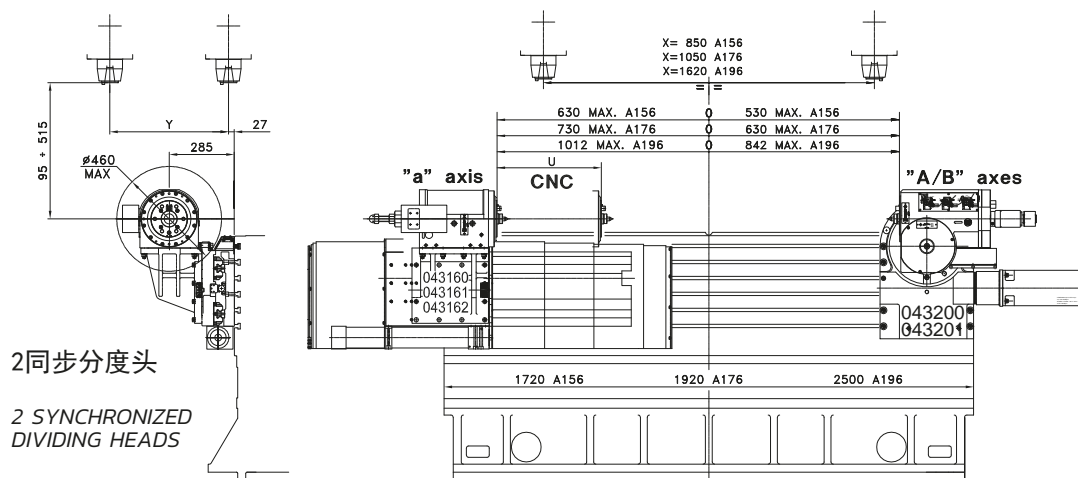


## 同步分度头 WITH SYNCHRONIZED DIVIDING HEAD

行程 TRAVEL (mm)

A152/156	500
A176	600
A196	800

200 RPM - 300 Nm - ISO 50



## 附件 ACCESSORIES

### 可移动刀库 MOVABLE MOBILE TOOL CHANGER

编号 CODE	刀柄/TAPER	数量 Qt	ø max (mm)	L max (mm)	Kg max
O44311	ISO V30	30	90	200	2
O44315	ISO V30	36	90	200	2
O44308	HSK-E40	30	100	270	2
O44327	HSK-E40	36	100	270	2
O44411	ISO V40	24	125	195	5
O44415	ISO V40	30	90	185	5
O44471	MAS-BT40	24	125	195	5
O44475	MAS-BT40	30	90	185	5
O44416	HSK-A63	24	100	250	5
O44418	HSK-A63	30	125	250	5

16

### 带门可移动刀库 MOVABLE MOBILE TOOL CHANGER WITH DOORS

编号 CODE	刀柄/TAPER	数量 Qt	ø max (mm)	L max (mm)	Kg max
O44313	ISO V30	30	90	185	2
O44314	ISO V30	36	90	200	2
O44335	HSK-E40	30	100	270	2
O44413	ISO V40	24	125	180	5
O44414	ISO V40	30	90	185	5
O44430	ISO V40	60 (链条式)	125	185	5
O44483	MAS-BT40	24	125	180	5
O44484	MAS-BT40	30	90	185	5
O44490	MAS-BT40	60 (链条式)	125	320	5
O44427	HSK-A63	24	105	220	5
O44428	HSK-A63	30	90	250	5
O44436	HSK-A63	48	110	250	5
O44432	HSK-A63	60 (链条式)	110	320	5



## 附件

### ACCESSORIES

机床可安装以下标准配件：

- 适用于钢件加工的排屑器
- 用于铝合金钛合金加工的排屑器
- 废气过滤器
- 75bar主轴中心出水
- 刀具气冷系统
- 刀具油气冷却系统
- 2D或3D接触式测头
- 接触式对刀仪
- 激光对刀仪
- 旋转视窗
- 根据要求可安装其他配件

*The machine can be equipped with the following STANDARD accessories:*

- Chips conveyor for Steel
- Chips conveyor for Aluminium/Titanium
- Exhaust filter
- Through spindle coolant system 75 bar
- Tool blower air system (standard)
- Tool blower air/oil system
- 2D or 3D Touch probe
- Touch tool setting device
- Laser tool setting device
- Spin window on door (rotoclear)
- Other options available on request



2D-3D 工件测量系统  
2D-3D control piece group



激光对刀仪  
Laser tools setting device



接触式对刀仪  
Contact tools setting device



中心出水冷却单元 - 75 BAR  
500升水箱 - 鼓式过滤器

THROUGH SPINDLE COOLANT GROUP - 75 BAR  
500 lts tank - Drum filter

## 数控系统选项 AVAILABLE CONTROLS



西门子 840D SL



海德汉 TNC 640

18

## 绝对测量系统 ABSOLUTE MEASURING SYSTEM



所有回转轴标配海德汉绝对编码器  
分辨率达到0.0001°

*All rotary axes are equipped with Heidenhain  
absolute encoders. Resolution 0,0001°*



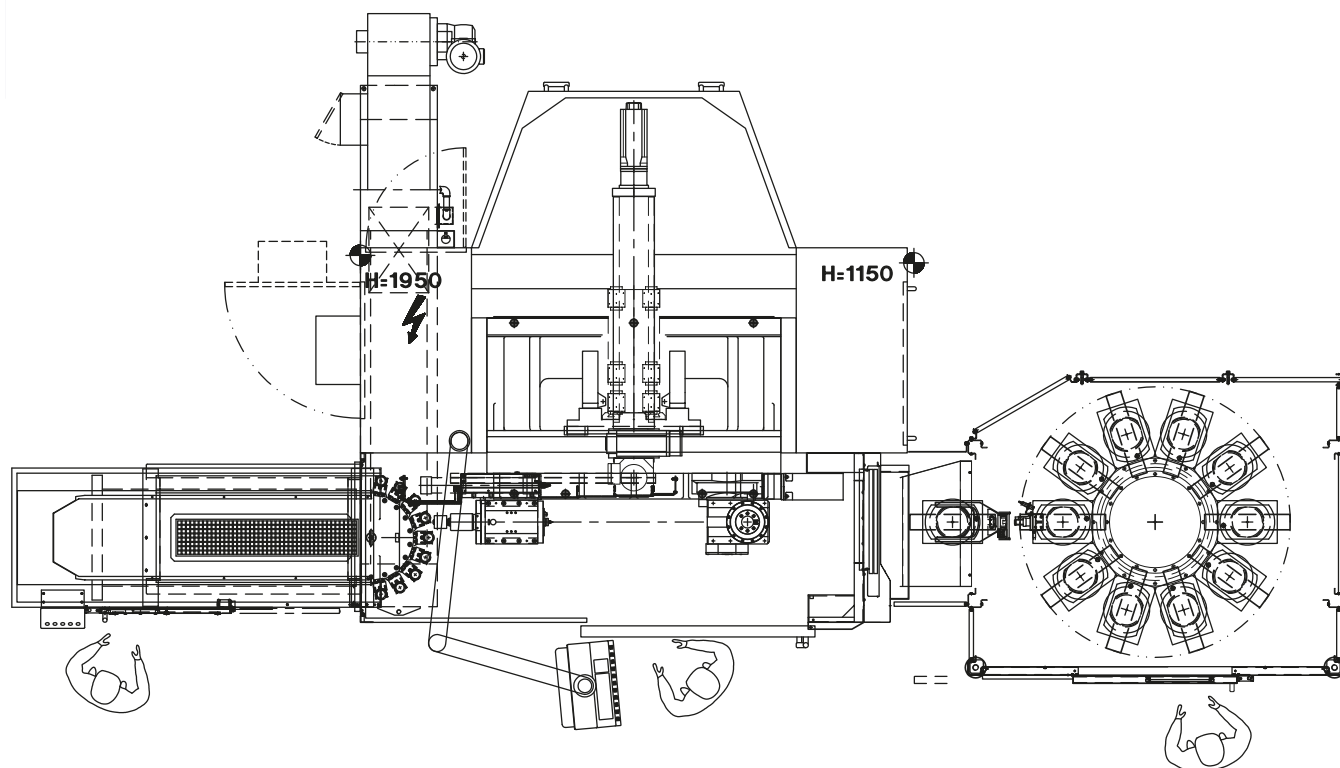
所有机床标配海德汉绝对光栅尺

*All machines are equipped with Heidenhain  
absolute linear scales.*

## 自动化解决方案 AUTOMATION SOLUTIONS

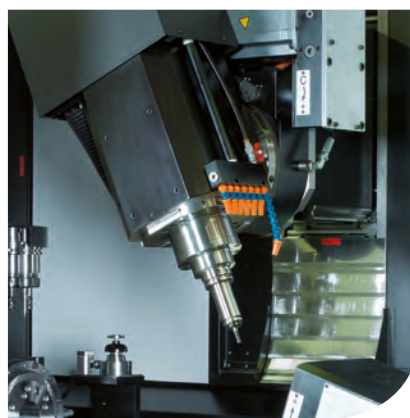
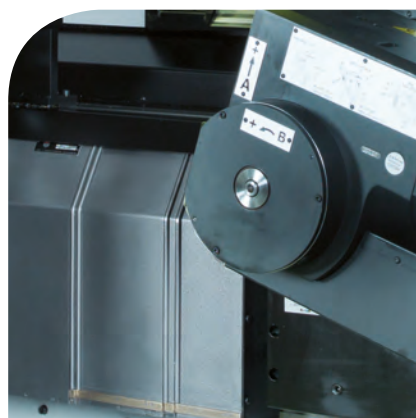
自动上下料的机械化系统  
机床可配置由C.B.Ferrari或其他供应商提供的自动化装载机械手。

*ROBOTIZED SYSTEM FOR THE AUTOMATIC PIECES CHANGE*  
*On the machining is possible to apply automatic loader, which can be produced by C.B.Ferrari or from external suppliers.*



19

## 机床升级 MACHINES UPDATE



可对旧机床的工作台、分度头 以及电主轴进行升级。  
*Possibility to update C.B.Ferrari used machines, with new tables, dividing heads and electrospindles.*

# C.B.Ferrari

**C.B. FERRARI S.r.l. a socio unico**  
*Società soggetta a direzione  
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