

**CNC LATHE**

**USC 850**

High-precision complete-machining for demanding turned parts



# Customized solutions for your production

EMAG offers three machine series that are perfectly tailored to different manufacturing requirements. From economical entry-level solutions to highly specialized systems, EMAG can help you find the optimal solution for your production.

## TURNKEY EXCELLENCE

### Complete solutions for all series

EMAG offers comprehensive turnkey solutions for all machines. From the initial process design to successful production implementation, you benefit from the decades of experience of EMAG's experts. The range of services includes:



Detailed process and tool design for optimized machining strategies



Precision cycle time calculation with the latest simulation software



Comprehensive project support from a single source



Worldwide service and spare parts supply

With EMAG, you not only get a machine, but a well-thought-out manufacturing solution that is precisely tailored to your requirements and your budget.





**COMPLETE  
SOLUTIONS**  
for all  
series



Reliable system availability  
and production times



## OUR SERIES

### 1 *Classic* MACHINES

#### The efficient entry into precision manufacturing

Classic machines combine maximum efficiency with the high quality you expect from EMAG. These machines focus on the essentials and offer an optimized range of functions for typical machining requirements. The base machine is purchased from selected partners and equipped by EMAG with proven process and machining technology, such as chucks and tools. You benefit from EMAG's worldwide service network and fast spare parts supply – the ideal choice for cost-efficient production without compromising on reliability.

### 2 *Modular* MACHINES

#### Customized flexibility

The modular machines, such as the VL series, expand the range to include flexible manufacturing solutions. These machines and system solutions are characterized by a modular design and can be adapted to your specific requirements using a wide range of options. They combine high productivity with outstanding adaptability – ideal for companies with more specific requirements.

### 3 *Customized* MACHINES

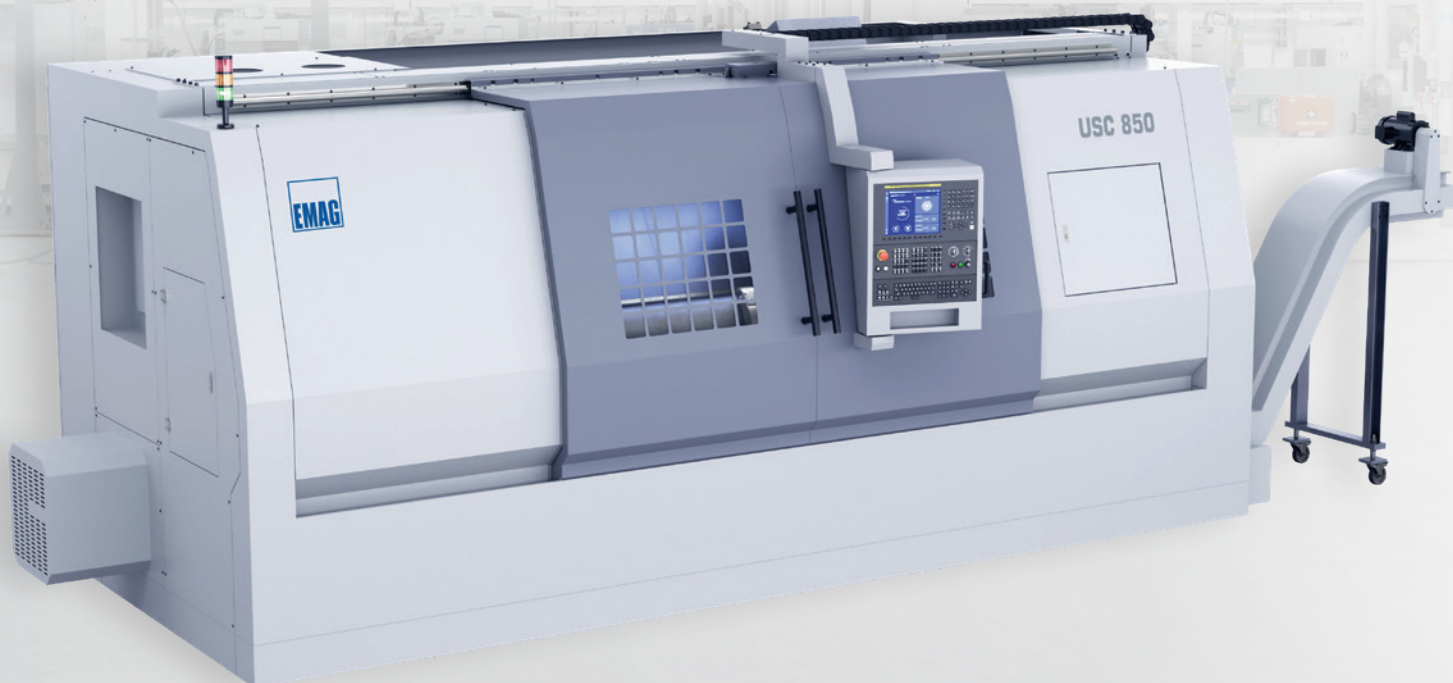
#### Maximum individuality

The customized machines, which include the VLC and VSC series, for example, represent tailor-made cutting-edge technology. Each machine is designed exactly according to customer requirements and is particularly suitable for highly complex processes that require maximum precision and specialization. These solutions offer the greatest possible flexibility for implementing individual production concepts.



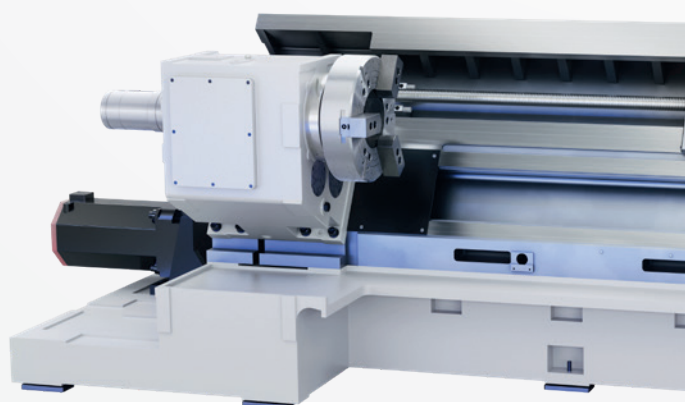
# Precision meets the highest productivity levels in the machining of large turned parts

The USC 850 CNC turning center is a high-performance machine designed specifically for machining large and complex turned parts. With its 3-axis machining (X/Z/C) and an IT6 manufacturing accuracy, it is ideal for the production of rotationally symmetrical precision parts in demanding industries such as automotive, aerospace and general engineering. The USC 850 not only offers exceptional precision, but also high productivity and reliability, making it an economical solution for the production of high-quality components.



## KEY FEATURES AT A GLANCE

Maximum swing diameter	mm	850
Maximum turning diameter	mm	600
Maximum turning length	mm	1.850
Workpiece weight with tailstock	kg	up to 3.000
Spindle passage	mm	135



# Machine structure

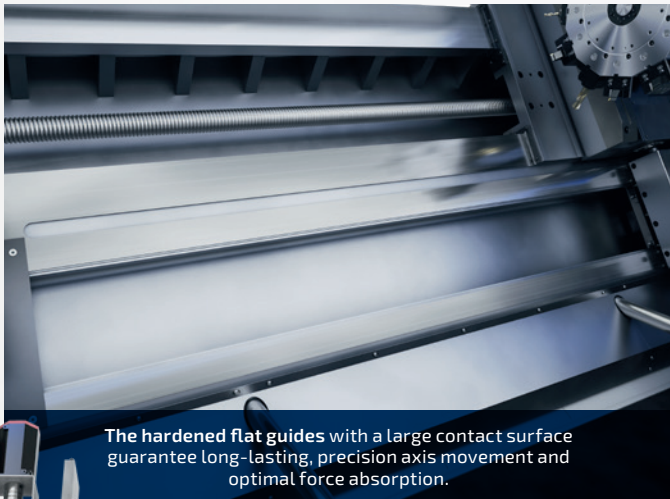
## Inclined-bed design

The USC 850 is designed with a 60° inclined bed, which, in combination with a massive base, ensures exceptionally high static and dynamic rigidity. This design minimizes vibrations during machining and provides excellent damping, resulting in consistently high manufacturing quality.

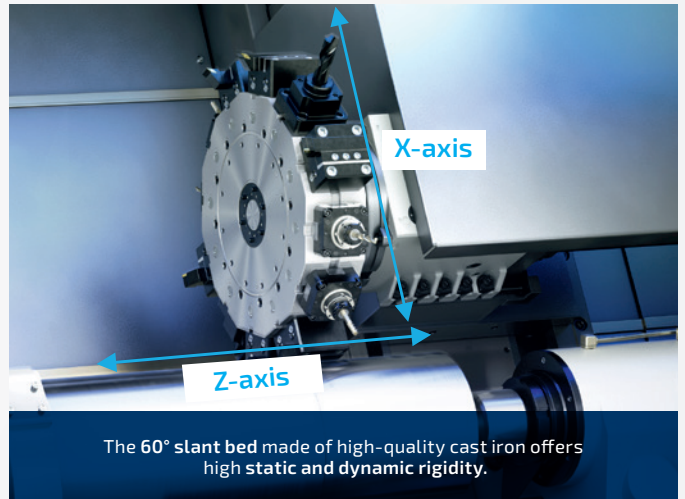


### ADVANTAGES

- + Solid cast iron machine base
- + Exceptional static and dynamic rigidity
- + Optimum vibration damping
- + Long-term stability of manufacturing precision



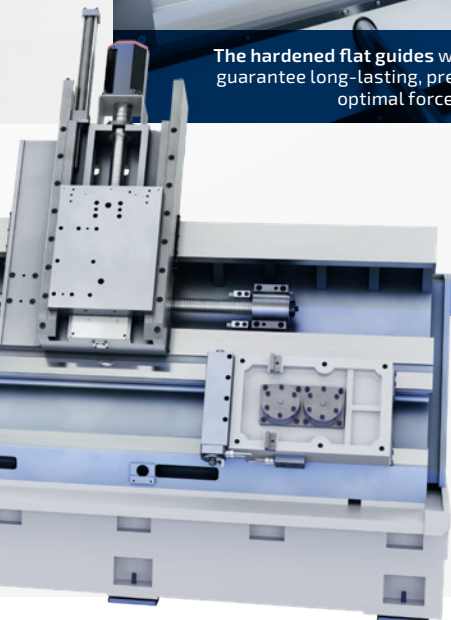
The hardened flat guides with a large contact surface guarantee long-lasting, precision axis movement and optimal force absorption.



The 60° slant bed made of high-quality cast iron offers high static and dynamic rigidity.

## High-quality materials

The bed, carriage and supports of the machine are made of high-quality cast iron and have been subjected to two stress-relieving treatments. This not only ensures high stability, but also excellent damping, which minimizes deformation-related manufacturing deviations. The hardened box guideways with large contact surfaces ensure precision and low-wear guidance of the moving machine parts.



# Machine structure

## Accuracy and productivity

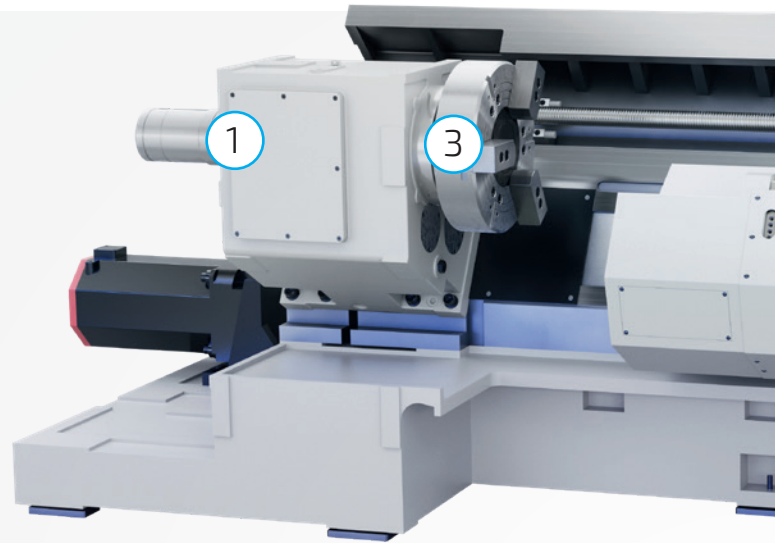
### High manufacturing precision

The high manufacturing precision of the USC 850 is demonstrated by the following key figures:

- » Positioning accuracy on the X/Z-axis: 0.009/0.018 mm
- » Repeatability on the X/Z-axis: 0.004/0.007 mm
- » Roundness in the standard test:  $\leq 0.004$  mm

### Fast rapid traverse speeds

The machine achieves rapid traverse speeds of 10/12 m/min in the X/Z direction, which shortens machining times and increases productivity. The centralized lubrication of all guides and ball screws maximizes the availability and service life of the components.



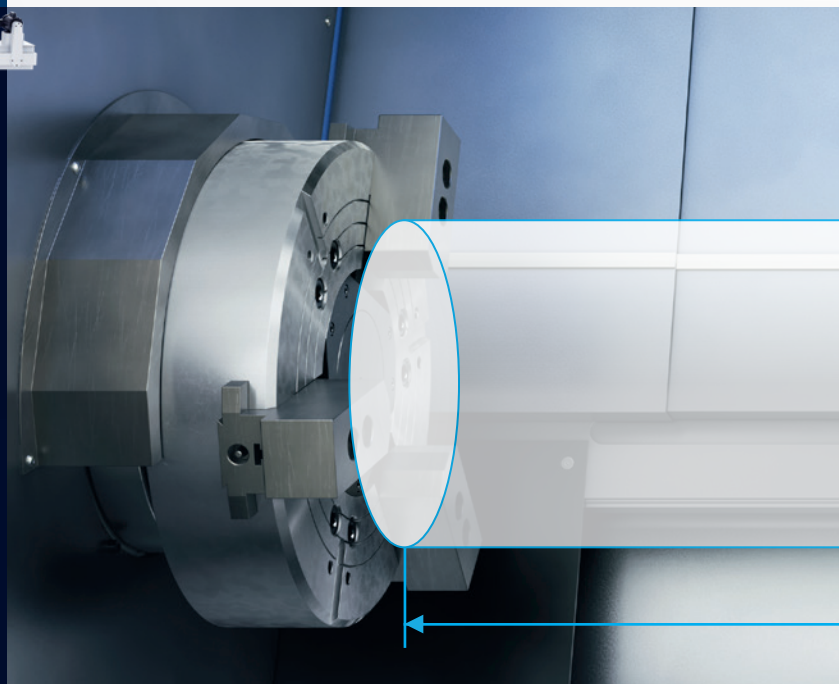
### 1 MAIN SPINDLE

Power	30 kW continuous operation (37 kW for 30 min.)
Speed range	10-850 min <sup>-1</sup> / 30-1,500 min <sup>-1</sup>
Spindle bearing	Combination of precision angular contact ball bearings and cylindrical roller bearings for high rigidity and concentricity
Spindle passage	135 mm
Concentricity	in the $\mu$ m range

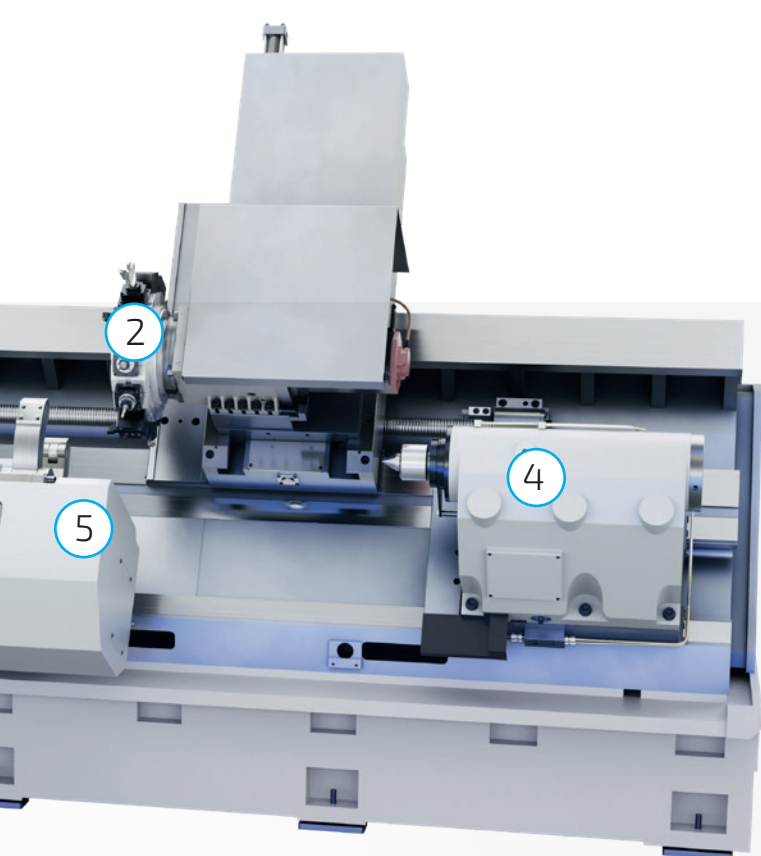


### Generous work area

- » Maximum swing diameter: 850 mm
- » Maximum turning diameter: 600 mm
- » Maximum turning length: 1,850 mm
- » Workpiece weight up to 3,000 kg with tailstock







## 2 TURRET

Motor speeds for driven tools	up to 3,000 min <sup>-1</sup>
Power-driven tools	3,7 kW (5,5 kW for 30 min.)
Recording	Turning tools 25 x 25 mm, drilling tools up to 50 mm diameter
Coolant supply	internal feed to the cutting edge for optimized tool life

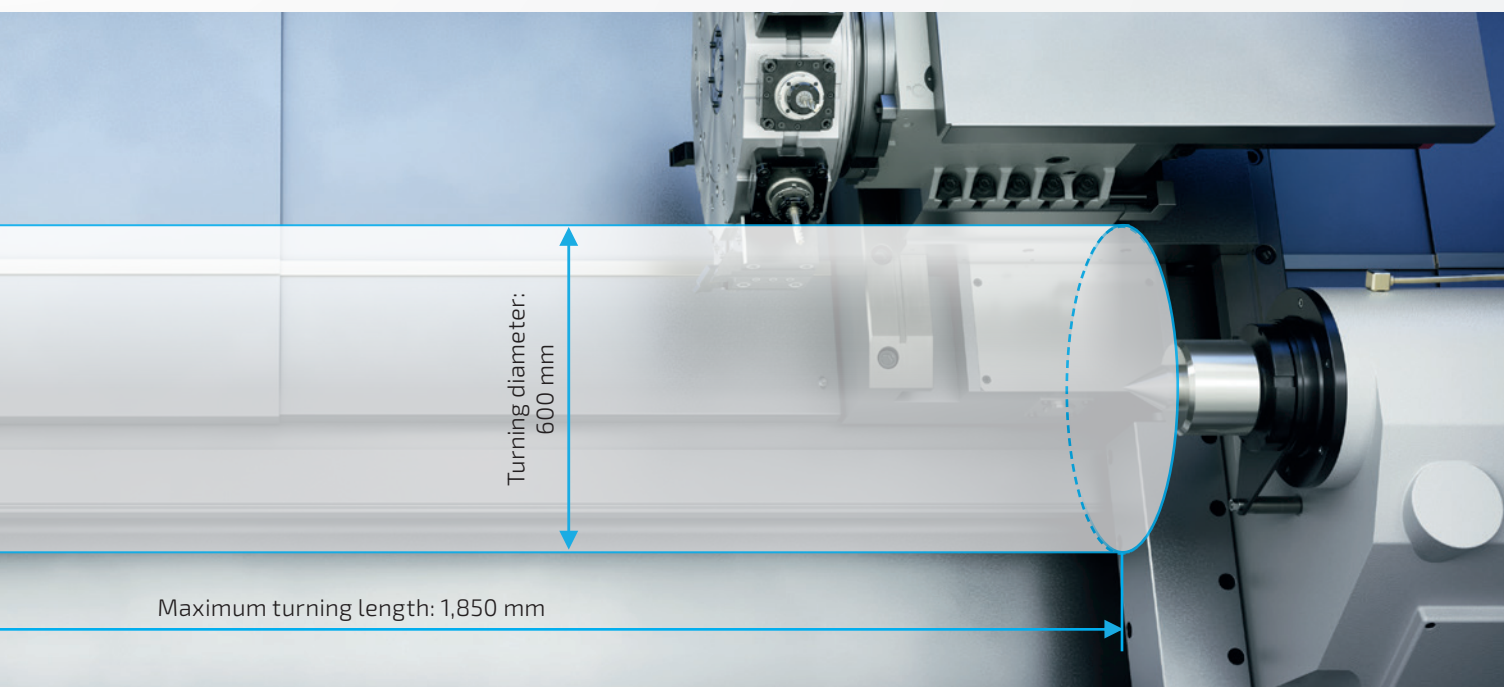
## 3 C-AXIS

Positioning accuracy	≤63" (0,0175°)
Repeatability	≤25" (0,007°)

## 4 TAILSTOCK

Hydraulic tailstock	
Quill diameter	150 mm
Quill stroke	150 mm
Mounting	MK6

## 5 HYDRAULIC STEADY REST



# Machine structure

## 1 SPINDLE UNIT

**The main spindle combines power with precision:**

- + 30 kW continuous power (37 kW for 30 min)
- + Speed range: 10-1,500 rpm
- + Spindle passage: 135 mm
- + A2-11 mount
- + Runout accuracy in the  $\mu\text{m}$  range
- + Optimized belt transmission for maximum torque



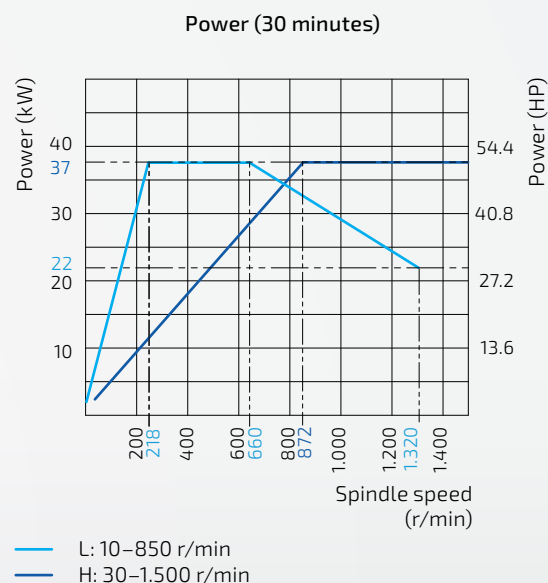
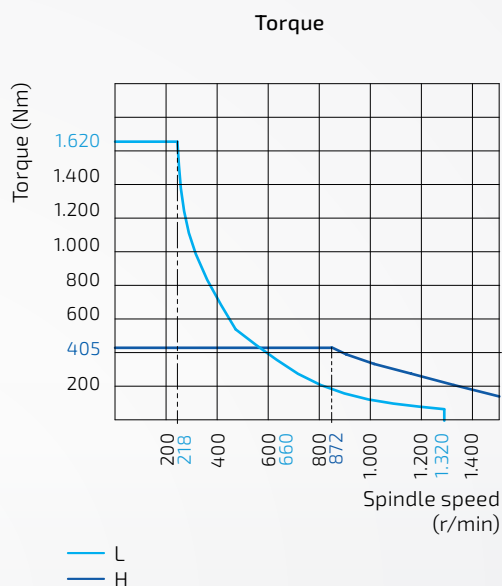
### Precision bearing

The spindle bearing consists of a high-precision combination of precision angular contact ball bearings and double-row cylindrical roller bearings. This bearing combination offers high rigidity and precise concentricity, even at maximum load. The spindle has a 135 mm through-hole and an A2-11 mount, which allows for flexible mounting of various workpieces.



## Powerful drive

The main spindle of the USC 850 is driven by a belt gearbox with two-stage transmission. A powerful servomotor with 30 kW continuous power (37 kW for 30 minutes) efficiently transfers the torque to the spindle. This drive design ensures optimal torque values in both the lower and upper speed ranges of 10-850 rpm and 30-1,500 rpm, respectively.



## 2 TAILSTOCK

The robust design of the USC 850 tailstock provides reliable workpiece support. The quill, which has a diameter of 150 mm and a stroke of 150 mm, is hydraulically actuated. The center point, which is included, is mounted using an MK6 taper.



## Easy operation

The tailstock can be operated either via the CNC program or via a foot switch for quick manual setup. The hydraulic pressures can be adjusted via easily accessible controls on the control panel and are displayed digitally. This allows the clamping forces to be optimally adjusted to different workpiece materials and geometries.

## 3 HYDRAULIC STEADY REST

The machine can be equipped with a hydraulic steady rest for long or thin-walled workpieces. This enables clamping ranges from 30 to 245 mm (alternativ from 45 to 310 mm) in diameter and ensures secure support even with critical workpiece geometries.



# Machine structure

## 4 TURRET

### Flexibility and versatility

The **BMT65 turret with 12 stations** enables flexible complete-machining of complex workpieces. All stations are designed for driven tools and can accept turning tools with a 25 x 25 mm shaft cross-section and drilling tools up to 50 mm in diameter.

### High motor speeds and drive power

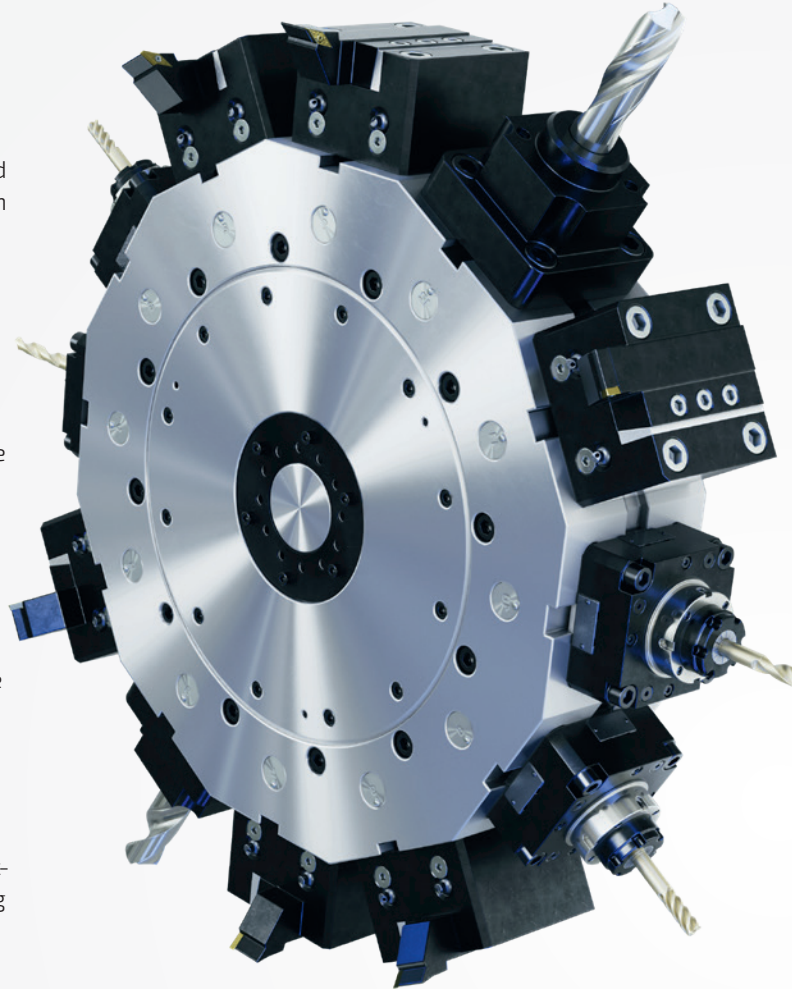
The driven tools can reach motor speeds of up to 3000 rpm with a drive power of 3.7 kW (5.5 kW for 30 minutes). This makes it possible to perform milling, drilling, and threading operations with a high degree of precision and efficiency. Tools are changed by the shortest route, with a repeatability of  $\pm 2$  arc seconds.

### Optimal cooling system

The coolant supply is routed internally through the turret, ensuring an optimal cooling system directly at the cutting edge. This increases tool life and improves the surface quality of the machined workpieces.

### Robust construction

The turret's robust design and precision indexing enable both heavy rough-machining and finishing with high dimensional accuracy. A hydraulic clamping system ensures exact positioning even under high cutting forces.



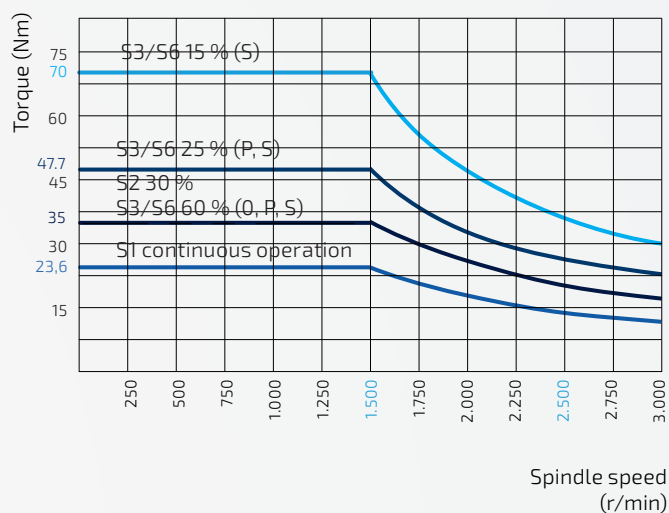
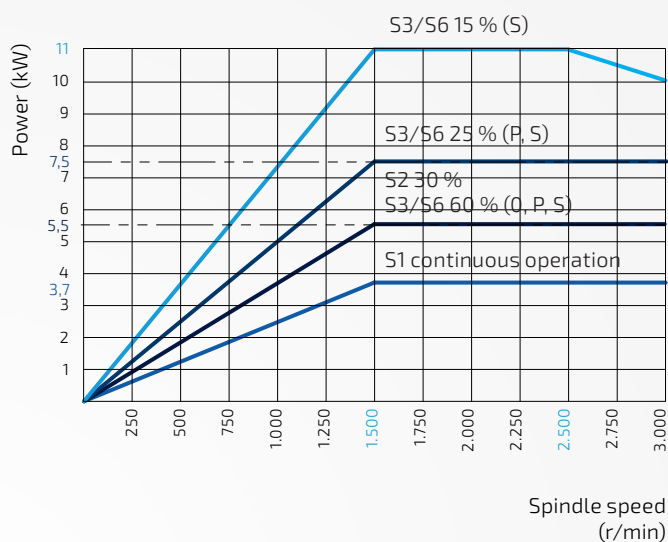
## BMT65 TURRET

The **12-station turret** is equipped with driven tools:

- + **Motor speeds of driven tools:** up to 3.000 rpm
- + **Power of driven tools:** 3.7 kW (5.5 kW for 30 min.)
- + **Shank:** turning tools 25 x 25 mm, drilling tools up to 50 mm diameter
- + **Repeatability:**  $\pm 2$  arc seconds
- + **Coolant supply:** internal supply to the cutting edge for optimized tool life



## Revolver power-torque diagram



## AUTOMATIC CHIP DISPOSAL

A chip conveyor ensures automatic chip disposal, which increases operating efficiency and reduces maintenance. The integrated overload protection ensures trouble-free operation and protects the machine from damage caused by overloading.

## CONTROL

### FANUC Oi-TF(1) control

The USC 850 is equipped with the FANUC Oi-TF(1) control, which offers all the functions required for complex multi-axis machining. The electrical components are housed in an air-conditioned electrical cabinet (IP54), which ensures reliable operation even under difficult environmental conditions.



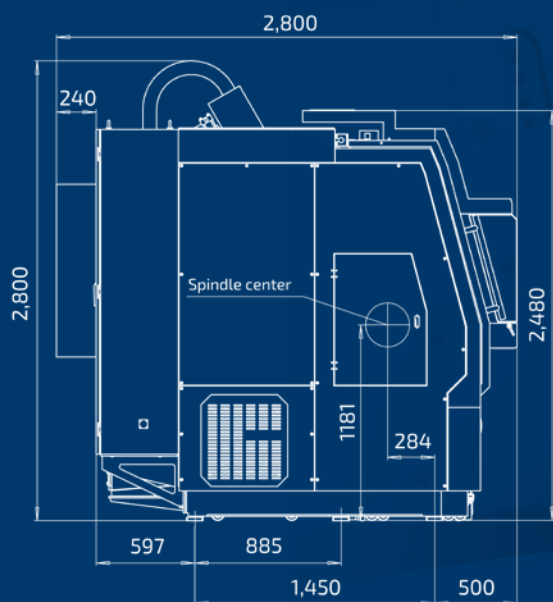
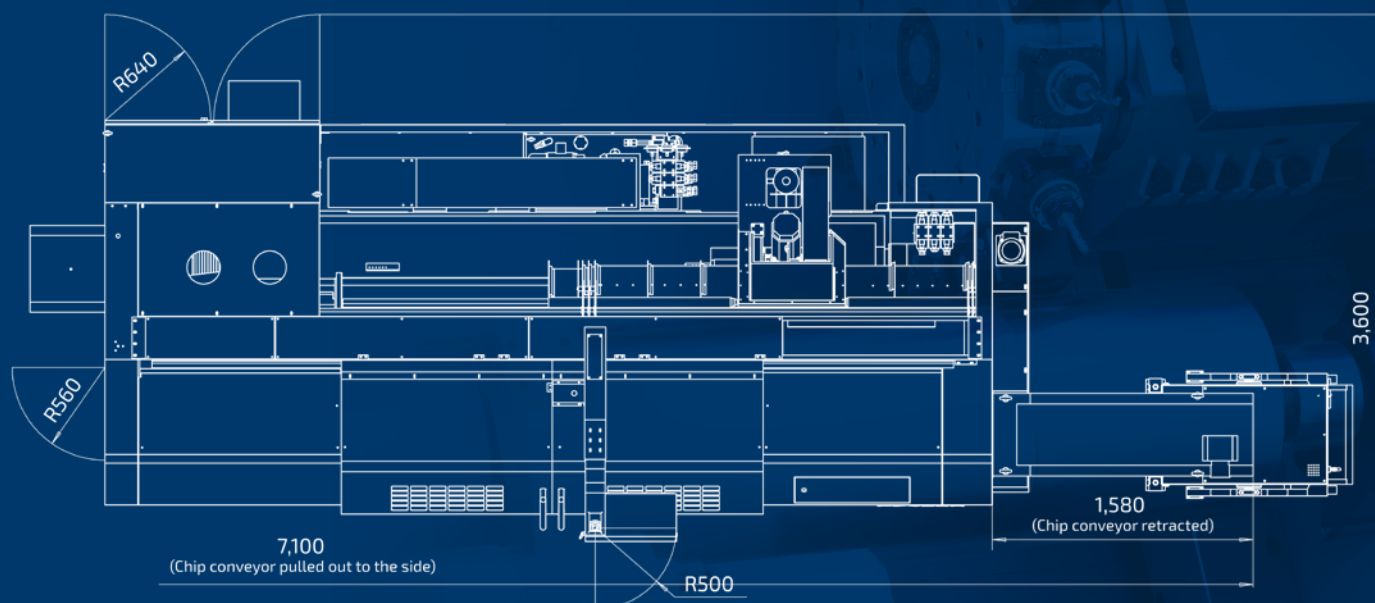
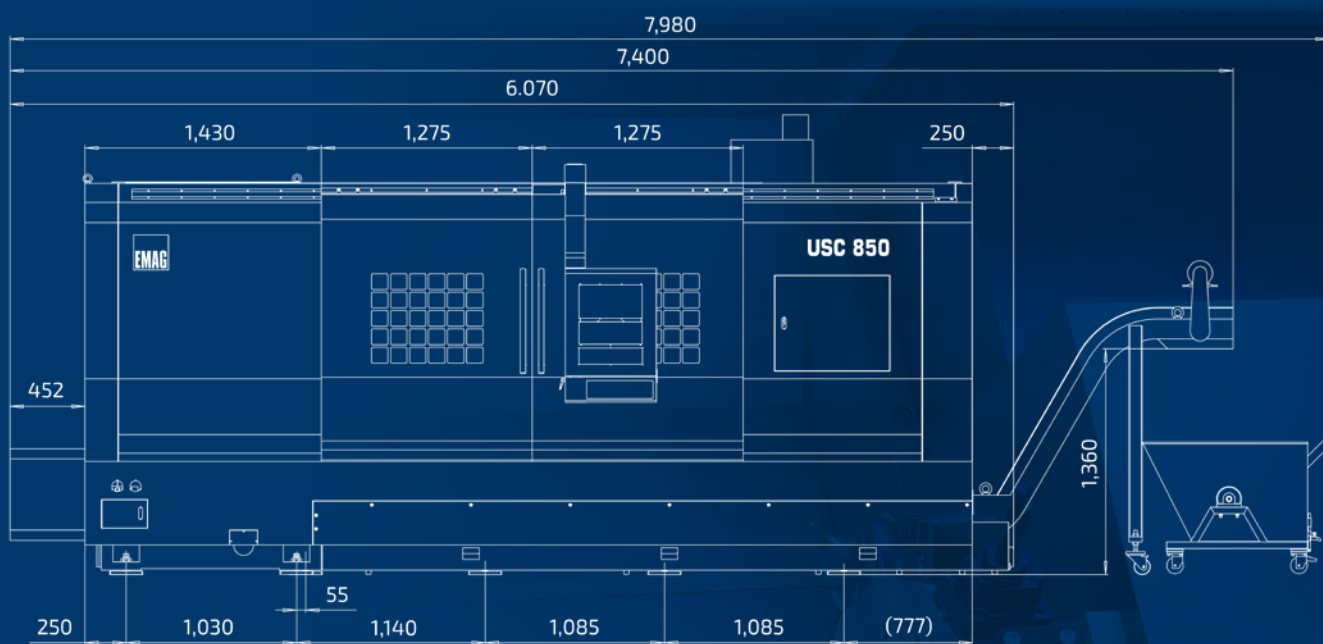


# Technical data



## USC 850

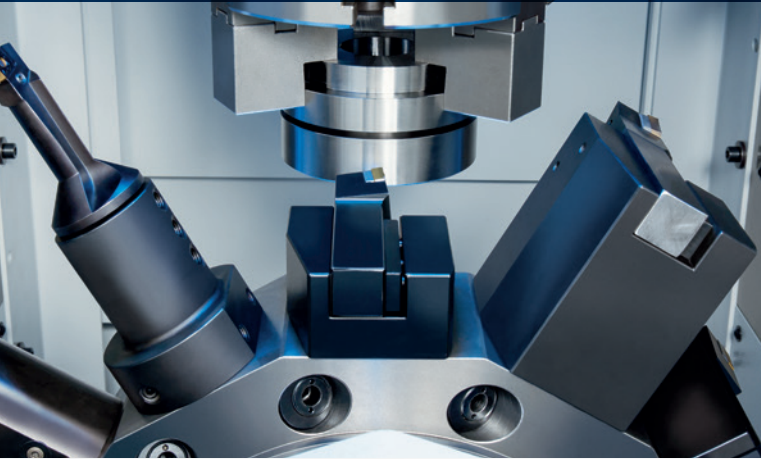
Work area	Maximum swing diameter	mm in	850 33,5
	Maximum turning length	mm in	1.850 72,8
	Maximum turning diameter	mm in	600 23,6
Main spindle	Diameter of the chuck	mm in	530/610 20,9/24
	Spindle nose Type	DIN ISO 702-1	A2-11
	Specification of the taper bore of the spindle	metric system	1:20
	Diameter of the spindle through-hole	mm in	135 5,3
	Spindle speed	U/min	l:10-850 h:30-1.500
	Spindle power (continuous/30 minutes)	kw	30/37
	Minimum indexing of the C-axis	DEG	0,001
Tailstock	Quill diameter / stroke	mm in	150/150 5,9/5,9
	Taper	MK	6
Turret slide	X-axis/Z-axis speed	mm in	330/1.850 13/72,8
	X-axis/Z-axis torque	m/min	10/12
Turret	Number of tool positions		12
	Tool size (turning/drilling)	mm in	25 x 25/Ø 50 1 x 1/Ø 2
	Motor speeds of rotating tool	Revolutions per minute	30-3.000
	Motor power of rotating tool	Kw	3,7/5,5
Other	Power supply specifications		50Hz 380V±10%, three-phase AC
	Power	kVA	75
	Machine size L×W×H (without chip conveyor)	mm in	6.070 x 2.800 x 2.800 239 x 110 x 110
	Machine weight	kg	17.000
	Maximum workpiece weight (both ends loaded)	kg	3.000 (21" chuck)



\*All dimensions in mm

# TECHNOLOGY. CONNECTED.

Turning Chucked Components



Turning Shafts



Gear Grinding



Cylindrical Grinding



Out-of-round Grinding

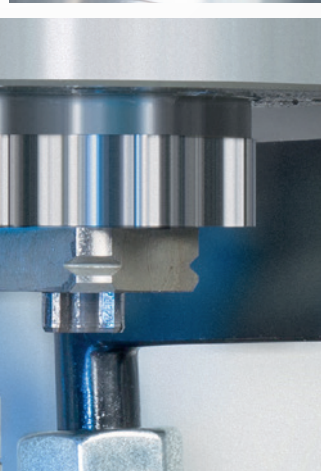




Milling



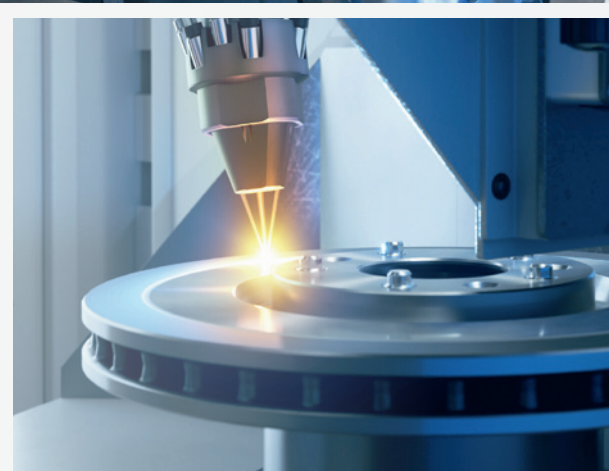
Gear Hobbing



Grinding



ECM/PECM



Laser Processing

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