emco group

Designed for your profit

EMCOTURN E65

Universal turning center for complete machining of bar stock and chuck work

TURNING

EMCO-WORLD.COM

The EMCOTURN E65 i

1 WORK AREA
- Easily accessible workspace
- Optimal chip flow
- Guideways fully covered

2 TOOL TURRET
- 12-position VDI30 (VDI40) axial
- 12 driven tool stations
- Servo-controlled
- Rigid tapping
- Polygonal turning, gear-cutting, etc.

3 Y-AXIS
- Travel +/–40 mm (1.6")
- 90° implemented in the machine construction
- Large distance between guide rails
- Stable and compact construction without restrictions

4 MAIN SPINDLE
- High drive performance
- Thermoresistant construction
- Large speed range
- A2-6 (A2-8) spindle connection
- Bar capacity Ø 65 (95) mm

Machine with optional equipment


Drive pulley
(Aluminium)


Connection part
(Stainless steel)

n the tailstock version

The new EMCOTURN E65 with tailstock underwent a complete redesign. As of now, it may be used with a Y-axis for the processing of complex turned/milled parts. A reduction in the auxiliary process times was achieved through increased rapid traverse speeds. There are two spindle sizes available: one with a bar capacity of up to 65 mm and another with up to 95 mm. Workpieces with a diameter of up to 95 mm may thus be automatically fed and processed by means of a short bar feeder.

5 CONTROL

- State-of-the-art control technology
- FANUC 0iTF / 15" incl. Manual Guide i
- SINUMERIK 828D / 15" incl. Shop Turn
- HEIDENHAIN CNC PILOT 640 / 15,6" incl. Smart Turn
- 90° pivot

6 MACHINE COVER

- All-round protection from chips
- 100% coolant retention
- Large safety glass window in door
- Clear view of the work area
- Built-in buttons for operator convenience

7 MACHINE DESIGN

- Compact machine design, requiring a comparatively small footprint

8 HYDRAULIC UNIT

- Hydraulic system
- Lateral arrangement of the hydraulic valves
- Very good accessibility
- Automatic setting of the pressure switches
- Programmable clamping pressure – optional

Adjustor sleeve
(Stainless steel)

Gear
(Bore hard-turned)

The EMCOTURN E65 in th

1 WORK AREA
- Easily accessible workspace
- Optimal chip flow
- Guideways fully covered

2 TOOL TURRET
- 12-position VDI30 (VDI40) radial
- 12 driven tool stations
- Servo-controlled
- Rigid tapping
- Polygonal turning, gear-cutting, etc.

3 COUNTER SPINDLE
- Complete machining of components
- Incl. C-axis for milling operations
- Incl. part ejector
- Incl. flushing
- Optionally available with a passage for unloading long shaft parts

4 Y-AXIS
- Travel +/–40 mm (1.6")
- 90° implemented in the machine construction
- Large distance between guide rails
- Stable and compact construction without restrictions

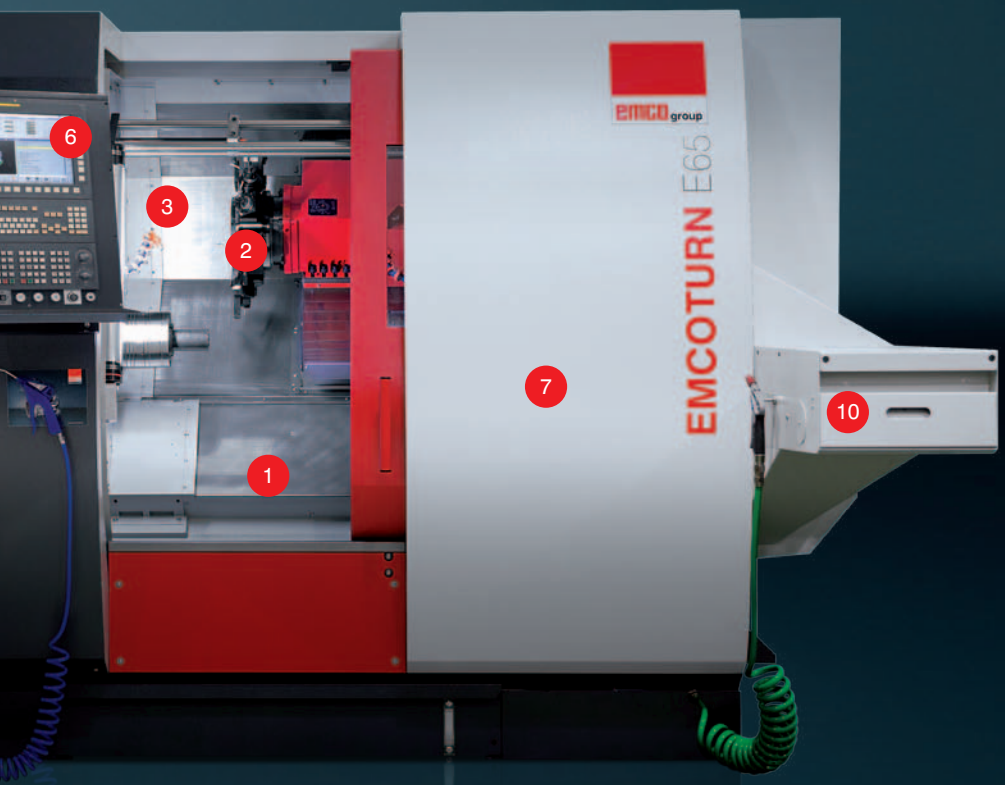
5 EMCO SHORT BAR LOADER SL1200
- Bar diameter 8 - 95 mm
- Bar length 250 - 1200 mm
- Material support 560 x 1210 mm
- Dimensions 1700 x 1250 mm
- 400 mm travel range

Carrier
(Heat-treatable steel)

Chain wheel adapter
(Aluminium)

ne counter spindle version

The new EMCOTURN E65 S with counter spindle, radial turret and optional Y-axis is the entry-level machine for the complete processing of turned/milled parts. Thanks to the fully-developed counter spindle, it is possible to turn, mill and drill workpieces on both sides. The counter spindle may also be used as a tailstock for supporting long workpieces. If required, large shaft parts may even be unloaded through the counter spindle.



Machine with optional equipment

6 CONTROL

- State-of-the-art control technology
- FANUC 0iTF / 15" incl. Manual Guide i
- SINUMERIK 828D / 10,4" incl. Shop Turn
- HEIDENHAIN CNC PILOT 640 / 15,6" incl. Smart Turn
- 90° pivot

7 MACHINE COVER

- All-round protection from chips
- 100% coolant retention
- Large safety glass window in door
- Clear view of the work area
- Built-in buttons for operator convenience

8 MACHINE DESIGN

- Compact machine design, requiring a comparatively small footprint

9 HYDRAULIC UNIT

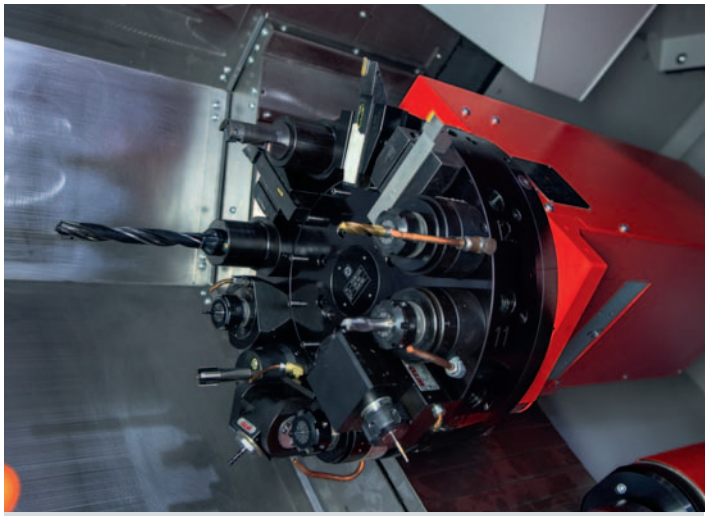
- Hydraulic system
- Lateral arrangement of the hydraulic valves
- Very good accessibility
- Automatic setting of the pressure switches
- Programmable clamping pressure – optional

10 FINISHED PARTS CONVEYOR

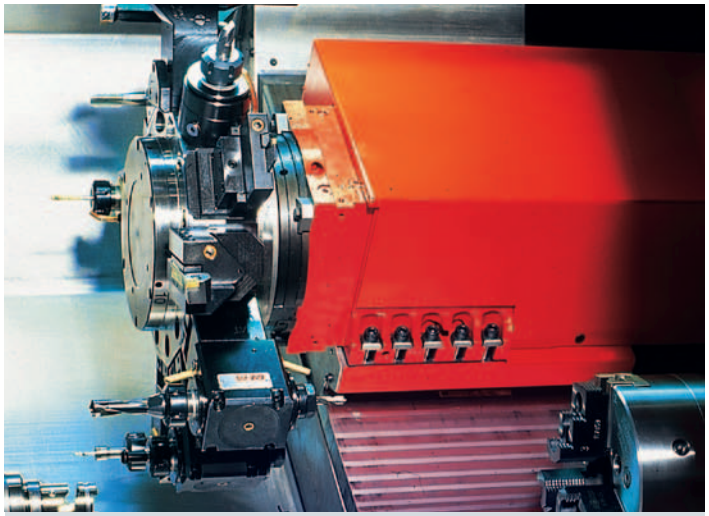
- Large storage capacity
- Automatical indexing
- incl. chip drawer

Eccentric disc
(Aluminium)

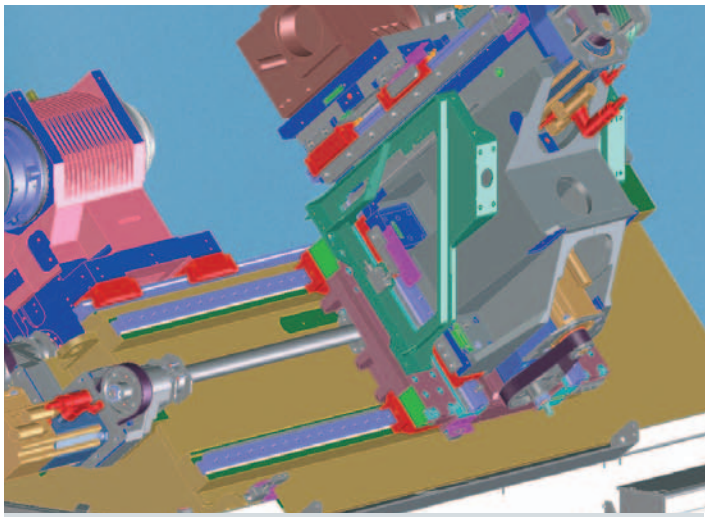
Distributor
(Steel)



Axial tool turret for the tailstock version. Quick 12-fold servo turret with very short indexing times for standardized VDI30 or VDI40 tools. All stations can include driven tool holders for drilling, milling or thread-cutting operations. The operator can influence the swing speed at any time.



Radial tool turret for the counter spindle version. Quick 12-fold servo turret with very short indexing times for standardized VDI30 or VDI40 tools. Angular holders equipped with ground alignment plates. No additional time consuming alignment necessary. All stations are driven and the indexing speed can be influenced by the operator at any time.



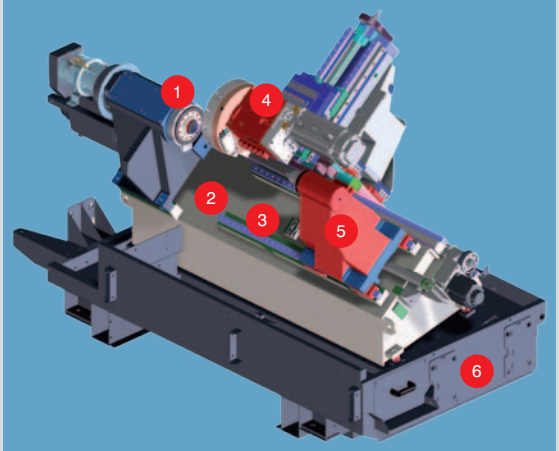
Y-axis carriage. The 90° offset machine base with the broad-based, prestressed guide rails ensures short overhangs and top stability for complete machining.

EMCOTURN E65
Technical

1 MAIN SPINDLE
- High drive power
- Compact, thermostable construction
- Large speed range
- A2-6 (A2-8) spindle connection
- Bar capacity diameter
  65 (95) mm (2.6“ (3.7“))

2 MACHINE BASE
- Extremely stiff welded steel fabrication
- Compact structure
- Very high thermostability
- Filled with vibration-absorbing material

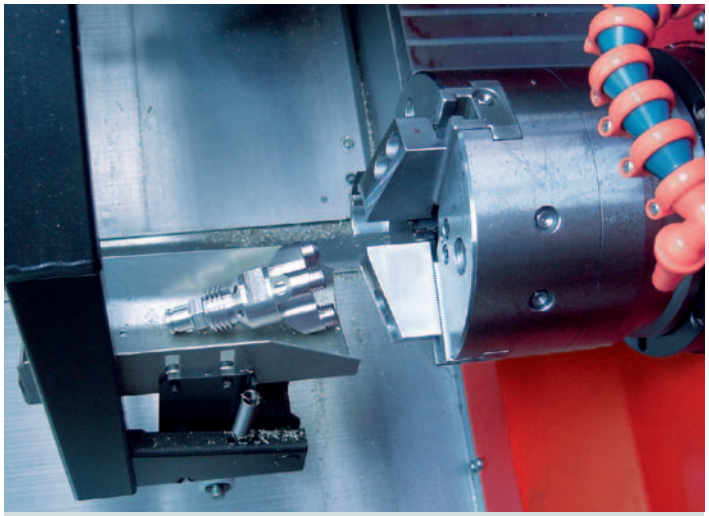
3 ROLLER GUIDES
- In all linear axes
- Preloaded
- No backlash in any direction of force
- High rapid motion speed
- No wear
- Minimal lubrication



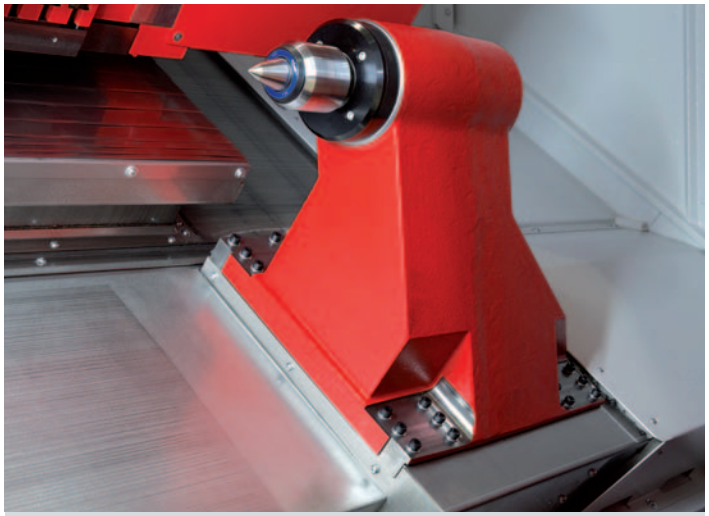
4 TOOL TURRET
- VDI quick change system
- Up to 12 driven tool stations
- High stability
- Synchronised thread cutting
- Swivel speed adjustable with override

5 TAILSTOCK
- Simple programming
- Flexibly applicable throughout the whole traverse range

6 MACHINE STAND
- Thermally isolated from the machine base
- Large coolant container that is easy to clean
- No leveling necessary
- 100% sealed against coolant leaks



Part pick-up device. Finished parts are transported from the main and counter spindle to the finished parts holder with the part pick-up device. This proven EMCO concept with the pivoting pick-up tray ensures optimum accessibility to the work area, free chip flow and the gentle removal of the finished parts.



Tailstock. In order to support slim components, the EMCOTURN E65 includes a fully automatic tailstock. It is hydraulically moved over a length of 500 mm. The centre with MT4 cone is directly included in the tailstock body. This ensures compactness and highest stability.

Highlights

Highlights

- **Powerful driven tools**
- **Y-axis for complexe milling operations**
- **Counter spindle for complete machining**
- **Flexible automatic tailstock**
- **Extreme machining precision**
- **Very compact machine layout**
- **State-of-the-art control technology from Siemens, Fanuc or Heidenhain incl. Shop Turn / Manual Guide i / Smart Turn**
- **Made in the Heart of Europe**

1 MAIN SPINDLE

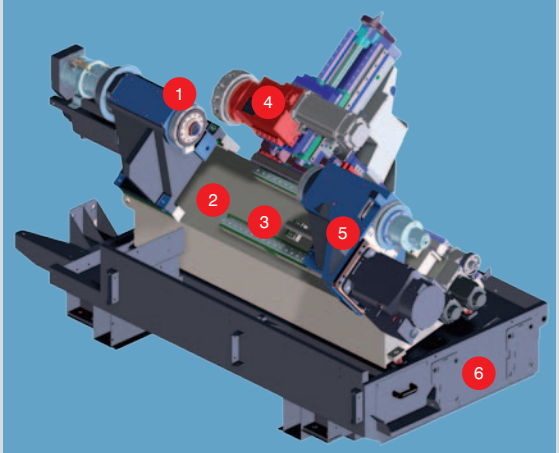
- High drive power
- Compact, thermostable construction
- Large speed range
- A2-6 (A2-8) spindle connection
- Bar capacity diameter
  65 (95) mm (2.6“ (3.7“))

2 MACHINE BASE

- Extremely stiff welded steel fabrication
- Compact structure
- Very high thermostability
- Filled with vibration-absorbing material

3 ROLLER GUIDES

- In all linear axes
- Preloaded
- No backlash in any direction of force
- High rapid motion speed
- No wear
- Minimal lubrication



4 TOOL TURRET

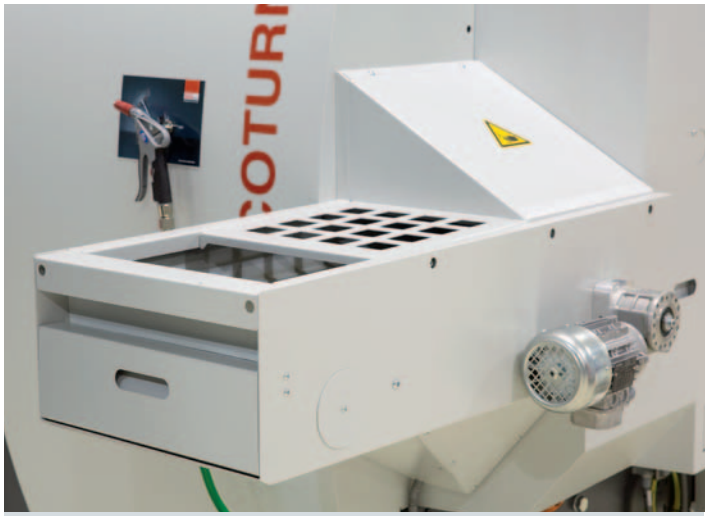
- VDI quick change system
- 12 driven tool stations
- No alignment of the tool holder
- Can be used on both spindles
- Swivel speed adjustable with override

5 COUNTER SPINDLE

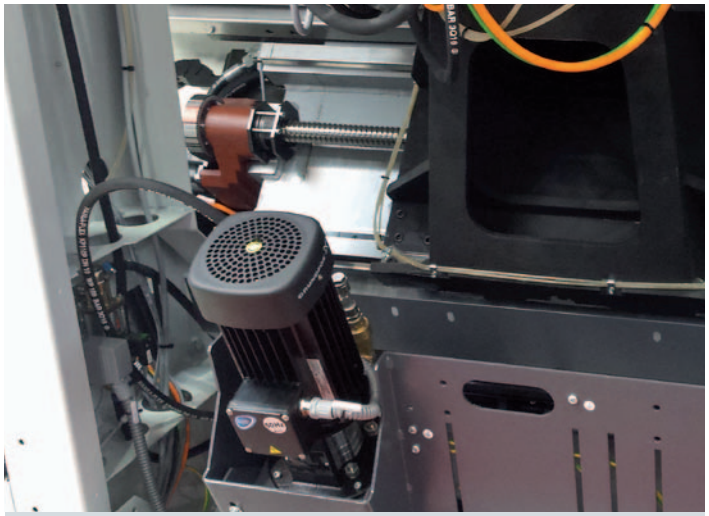
- Large speed range
- C-axis
- Spindle clamp
- A2-6 spindle connection

6 MACHINE STAND

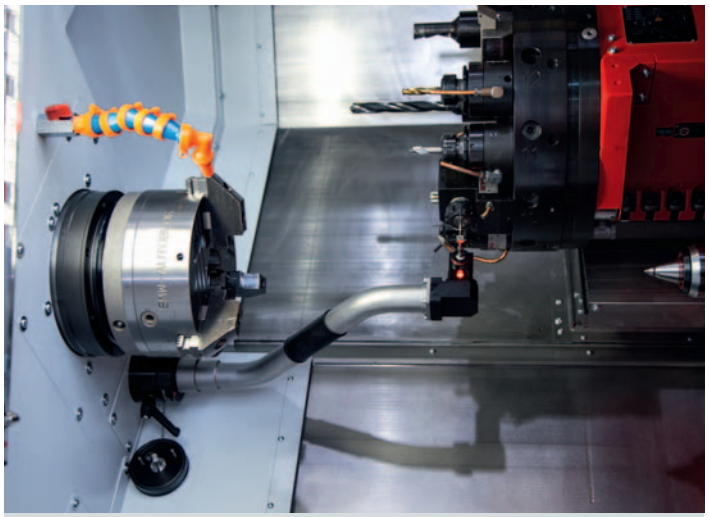
- Thermally isolated from the machine base
- Large coolant container that is easy to clean
- No leveling necessary
- 100% sealed against coolant leaks



Finished parts conveyor. The finished parts catcher places the finished parts onto a collector belt. Since the belt is clocked, the parts – which are often very complex – are kept from falling on top of each other.



Increased coolant pressure. A 14 bar coolant pump is available as an option and alternative to the 3.5 bar version. It completes the pumps in the basic machine. For maintenance purposes and to clean the coolant tray, the pumps can easily be swung out so that the coolant tray can be pulled out towards the front.



Tool measurement. The optional tool measuring sensor in the work area allows for fast and precise tool measurement within the machine. It is manually mounted below the main spindle. After use, it is removed and placed onto a tray on the left-hand side of the machine casing.

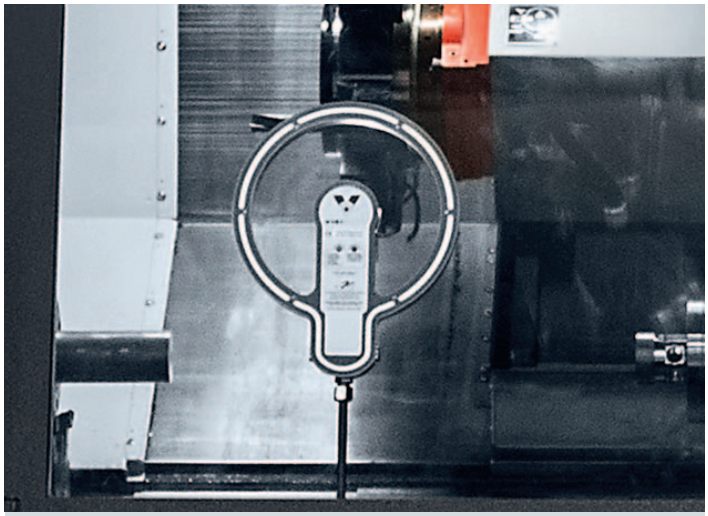
EMCOTURN E65

Options & A

EMCO TOP LOAD. For fully automated loading of 3-metre bar material into the machine. Multi-Level material overlays allow for longer periods of unmanned operation.

EMCO short loader. In order to tackle the ever-increasing pressure relating to machine footprints, EMCO has developed the most compact short loader available on the market: EMCO SL 1200.

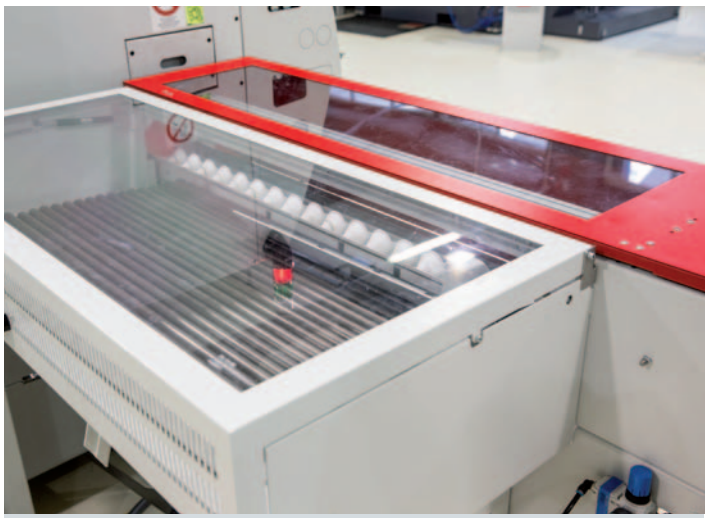
Belt filter system. If required, it is possible to install an optional 600-litre belt filter system with 25 bar high-pressure coolant pumps. It increases both the cooling emulsion volume and the coolant's service life.



Spin window. The optional spin window allows for a perfect view into the work area, also during machining with coolant. Thanks to the spinning pane, the coolant is slung away immediately after the impact. Thus, the pane remains perfectly clear.

Accessories

Measuring sensor storage. Protected storage area for the measuring sensor and the adjustment gauge.



Material support. The material support attached to the back of the SL 1200 features a surface of 560 x 1210 mm and allows stocking a large number of bars. This allows for unmanned production. To ensure compliance with the safety guidelines, the material support is covered by a hood.

Operating panel. The operating buttons and the diameter adjustment are located on the front side of the SL 1200. If required, the loader can easily be moved 400 mm to the left.

The CNC control unit: The brains of each CNC lathe

Machine tools are facing ever-increasing requirements. They are supposed to be ever faster, ever more precise and ever more user-friendly!
Nowadays, these criteria are met by modern CNC control units. What is new, however, is the wish for networking, something that the state-of-the-art controls included in EMCO's machine tool programme are capable of. Many customers are asking for standardized control units within their production. In order to cater for these needs, the EMCOTURN E 65 is available with three control versions.

SINUMERIK 828D

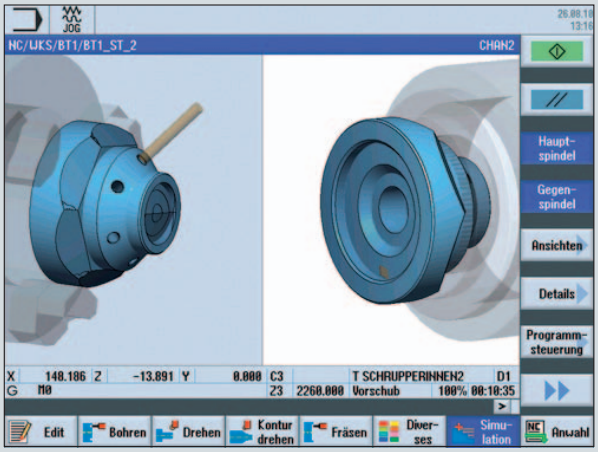
High-performance CNC control for maximum precision and processing speed. Thanks to a flexible CNC programming language and unique ShopTurn work stage programming, both large-scale production parts and individual workpieces may be programmed and machined with maximum efficiency.
With powerful kinematic transformations and a comprehensive set of technology cycles, the SINUMERIK 828D is also ideal for sophisticated machining with driven tools and counter spindle.

FANUC 0iTF

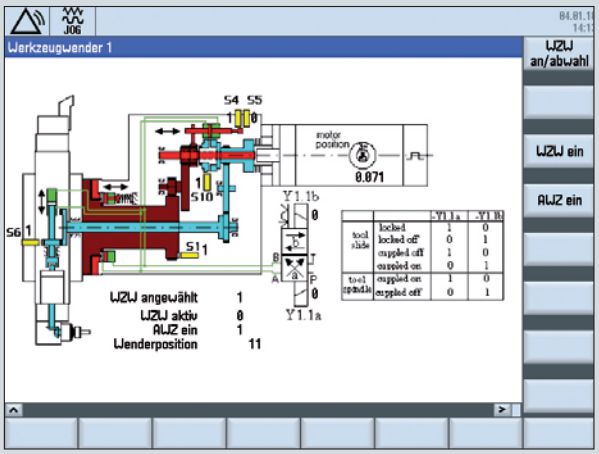
The CNC-series 0iTF model is the ideal solution for compact high-end lathes. An attractive price-performance ratio teamed with unmatched dynamics, precision and reliability. This control unit is characterised by easy operation and programmability. Using the FOCAS interface, it can easily be connected to higher-level IT systems, whilst offering maximum performance and functionality. Easy and rapid automation by means of a robot or gantry loader is guaranteed.

HEIDENHAIN CNC PILOT 640

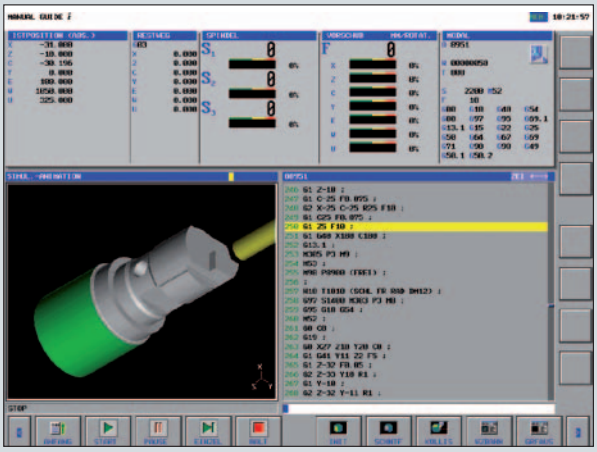
Thanks to the flexible design and due to its versatile programming possibilities, Heidenhain's CNC PILOT 640 always offers the right support – regardless of whether you manufacture simple or complex workpieces. The CNC PILOT 640 is characterised by easy operation and programming, which is why it requires only little training.



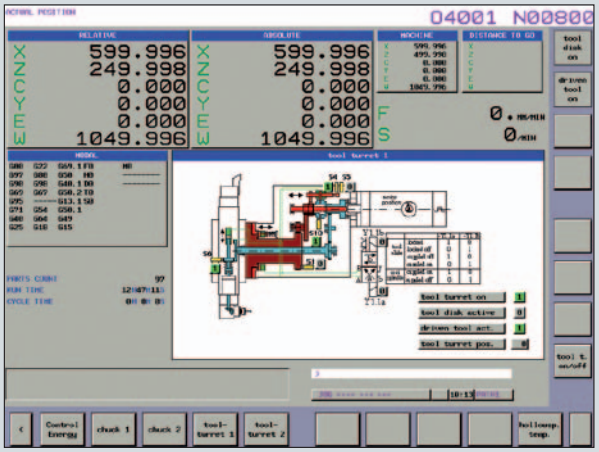
3D simulation



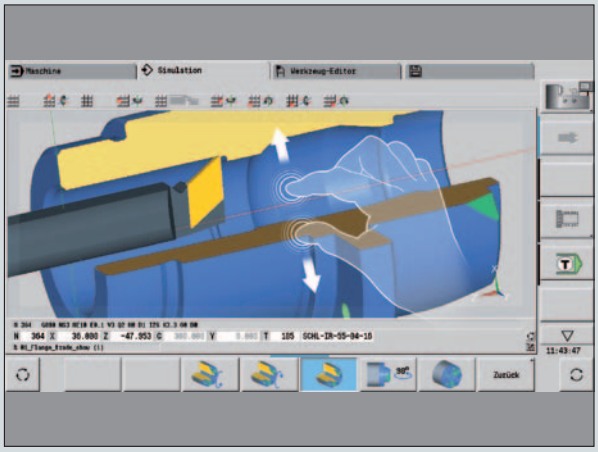
EMCO diagnostic images



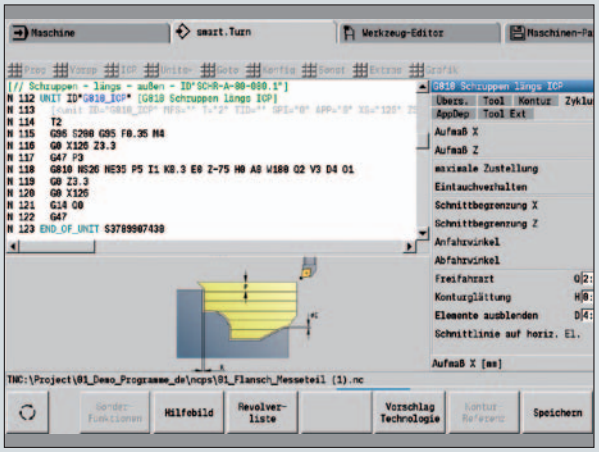
3D simulation



EMCO diagnostic images



3D simulation



SmartTurn programming assistant

The EMCO gantry loader. Individual process optimization.

1 GANTRY LOADER

2 PALLET MAGAZINE

3 GRIPPER SYSTEM

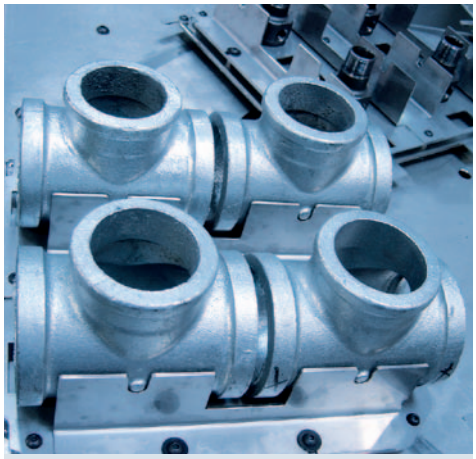
Advantages

- Fully automated loading and unloading of the workpieces
- Multi-channel Sinumerik control incl. user cycles
- Seamless interplay between the machine tool and the loading device
- Varied possibilities of customer-specific adaptation
- Possibility of integration of measuring station, signing station, cleaning station, etc.
- Short non-productive times due to a loading hatch

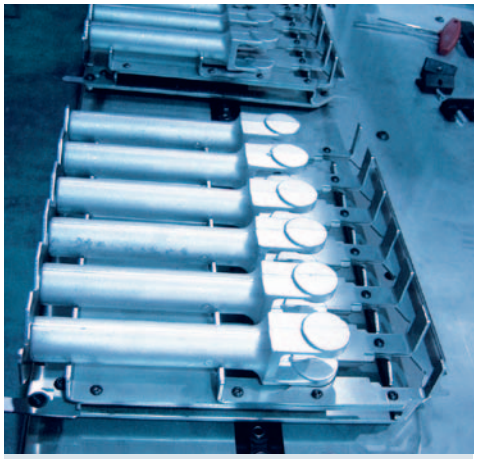
Automatic Return on Investment

Workpiece magazine

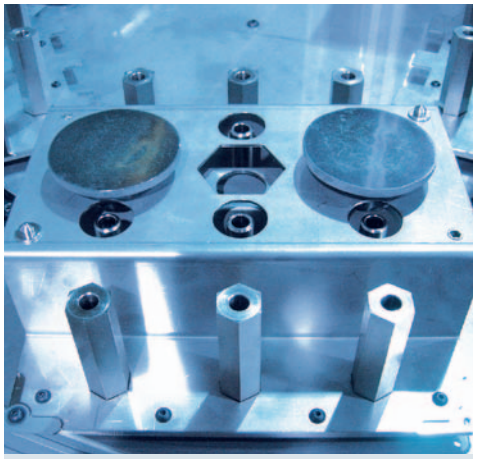
Blank-specific pallet attachments enable oriented loading of blanks into the machine and increase the parts stock for unmanned production. Changeover times are reduced or eliminated thanks to the perfect adjustment to the customer‘s parts.



4-station pallet attachment for tees



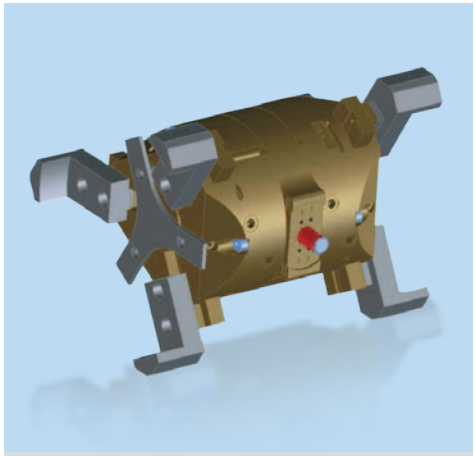
6-station pallet attachment for articulated brackets



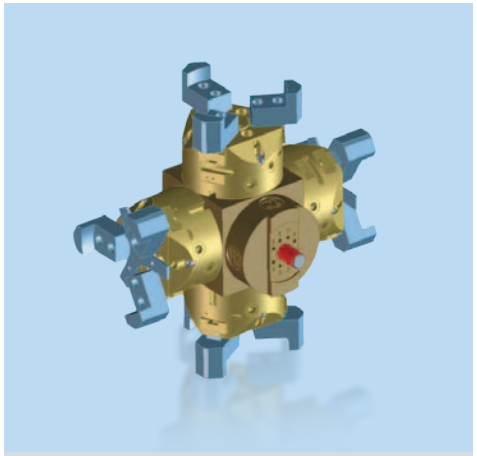
Multi-pallet attachment for a family of parts

4-station pallet attachment for valve caps

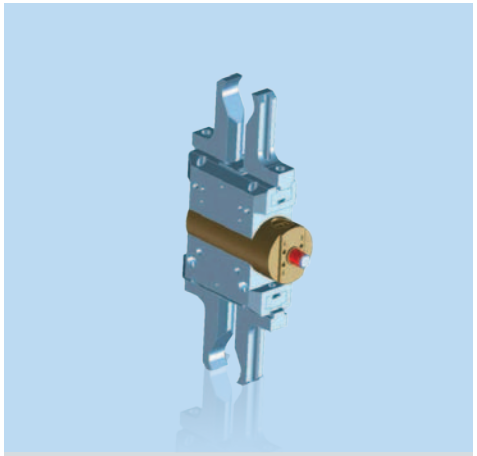
20-station pallet magazine with customer-specific pallets



2 x 3-jaw double gripper head

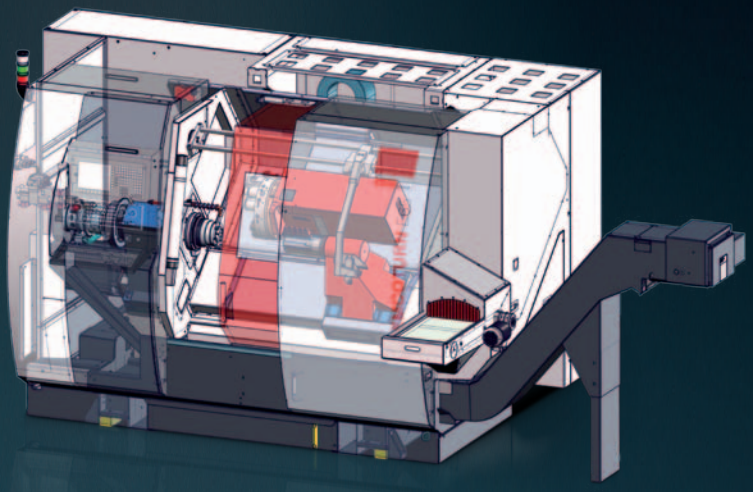


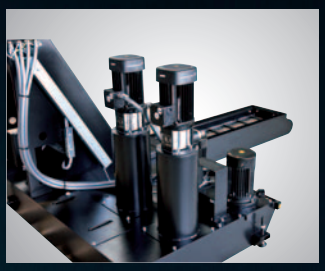
4 x 3-jaw gripper head



Shaft gripper head

Quality Components





Coolant pumps

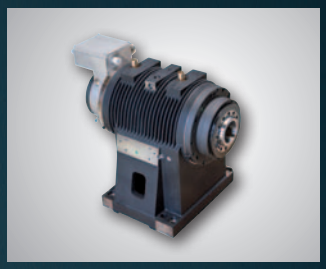
Low-maintenance immersion pumps for pressures of up to 25 bar and flow rates of up to 1500 l/min provide optimum conditions for machining and enable reliable chip transportation.

Clamping cylinder / chuck

Hydraulically activated clamping cylinders and chucks guarantee the precise, safe clamping of workpieces. Programmable sensors are used for stroke monitoring. There is no need for time-consuming adjustments of contactless limit switches.

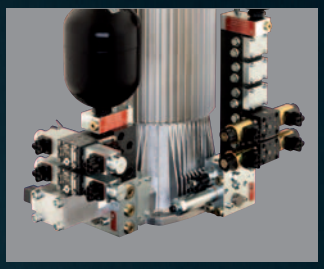
Tool holder

Innovative, fully developed tool holder systems form the basis for cost-effective machining. High changeover accuracy and stability result in short setup and cycle times.



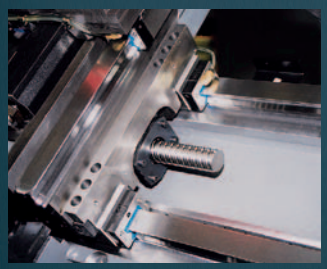
Headstocks

The design and manufacture of headstocks are two of EMCO's core competencies. During engineering, the focus is on precision, robustness, high rigidity, precise rotational characteristics, and a long service life.



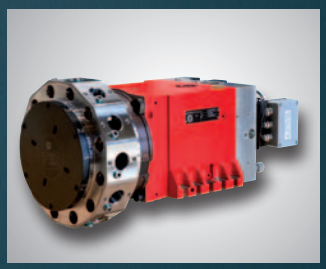
Hydraulic systems

Compact dimensions, quiet operation, and high energy efficiency - just some of the advantages of the hydraulic assemblies used by EMCO. Monitored pressure switches prevent the need for time-consuming manual pressure adjustments.



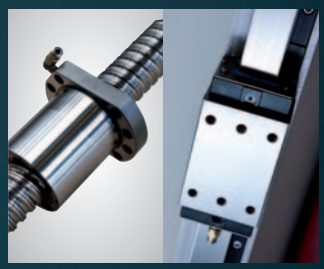
Machine bases and slides

When matching components, we place great value on high stability, good damping characteristics, and a thermoneutral design. We achieve high stability through a shorter force flow, thermal stability through symmetry, and dampening through the materials and interfaces selected.



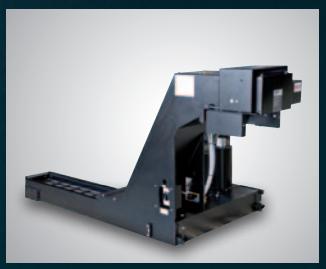
Tool turret

Rapid-indexing turrets with adjustable swivel speeds and milling drives represent the current state of the art. The backlash-free milling drive is not only ideal for milling and drilling, but also for rigid tapping, hobbing, and polygonal turning.



Ball screws and roller guides

Highly precise and generously dimensioned guide rails and ball screws with optimal pretensioning form the basis for the machining of precision parts.



Chip conveyor

Slat band conveyors allow for flexible implementation and the safe removal of chips. A monitored overload clutch prevents damage from improper use.

Minimum use of resources for maximum profit.

E[M]COLOGY
Designed for Efficiency

At EMCO, we take a consistent, responsible approach to the use of resources in machine tools in order to safeguard long-term investments. From the development of our machines through to their construction and manufacture, we place a strong focus on the sensible and sparing use of raw materials and energy. This enables us to achieve parallel savings in two areas:

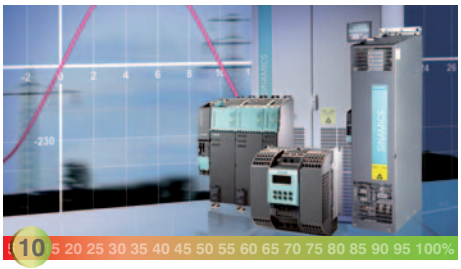
1. Reduction in the basic power consumption of machine tools, e.g. assemblies are switched on and off as required and the installed connected loads are kept to a minimum.

2. Reduction in variable consumption: This can be seen in the lighter axes, energy recovery system, increased rate of good parts, and the shorter process chain enabled by complete machining.

Through these measures, which are constantly being refined and further optimized, EMCO truly demonstrates that its slogan of „Designed for your Profit“ is not just an empty promise: EMCO products help save the environment and provide intelligent customer savings without compromising on quality and flexibility.

[Regenerative drive system]

Kinetic energy is converted into electrical energy and fed back into the grid.
Savings of up to 10%

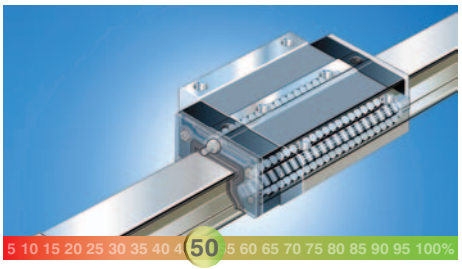


[Compact hydraulics unit with pressure accumulator]

Thanks to its accumulator charging system, the pump only runs when required. If the pressure accumulator is full, the pump switches over to closed loop circulation.
Savings of up to 90%

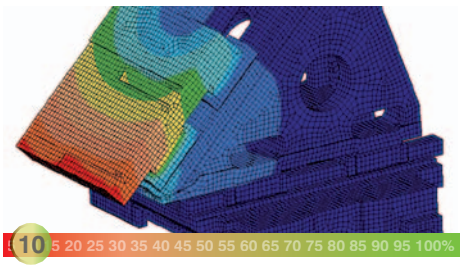
[Roller guides]

Extremely low friction losses thanks to rolling friction. Highly dynamic performance with minimal lubricant consumption.
Savings of up to 50%



[Structurally optimized mechanics]

FEM analysis is used to optimize the relevant components in terms of their rigidity while simultaneously reducing their weight.
Savings of up to 10%

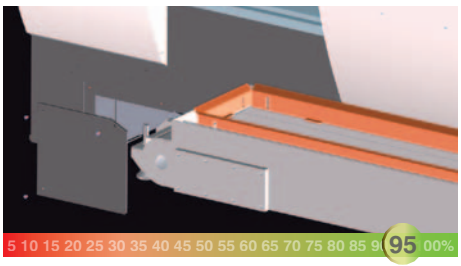


[Highly efficient motors]

The use of energy-efficient motors (IE2) in the coolant preparation area guarantee highly cost-effective operation.
Savings of up to 10%

[Synchronized chip conveyor]

Programmable interval times enable optimal use of the chip conveyor independently of the machining process.
Savings of up to 95%

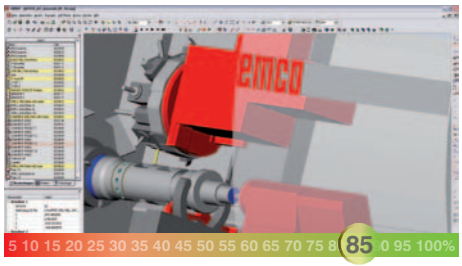


[Intelligent standby concepts]

Reduced consumption by automatically switching off ancillary units and machine space/screen illumination after a defined period of inactivity on the control panel.
Savings of up to 50%

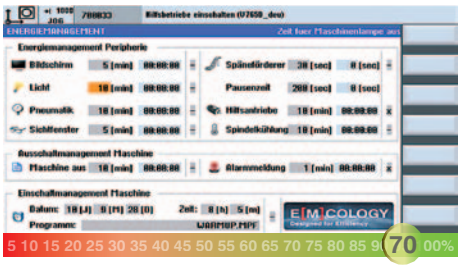
[Virtual machine]

Significant reduction in the setup and running-in times on the machine through the use of highly developed simulation and programming software.
Savings of up to 85%

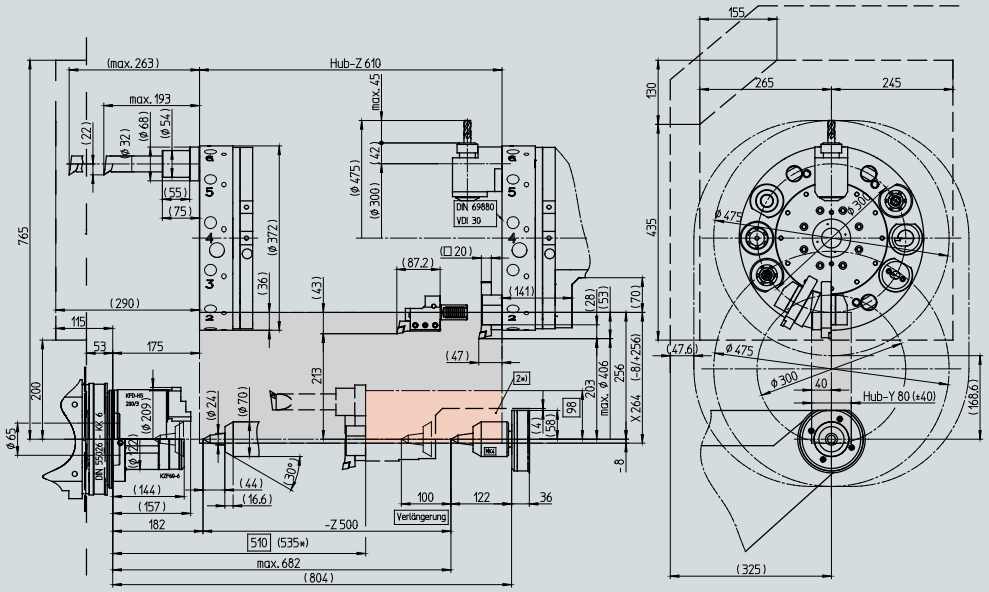


[Intelligent energy management]

Intuitive data entry screens for activating the individual energy-saving functions.
Savings of up to 70%

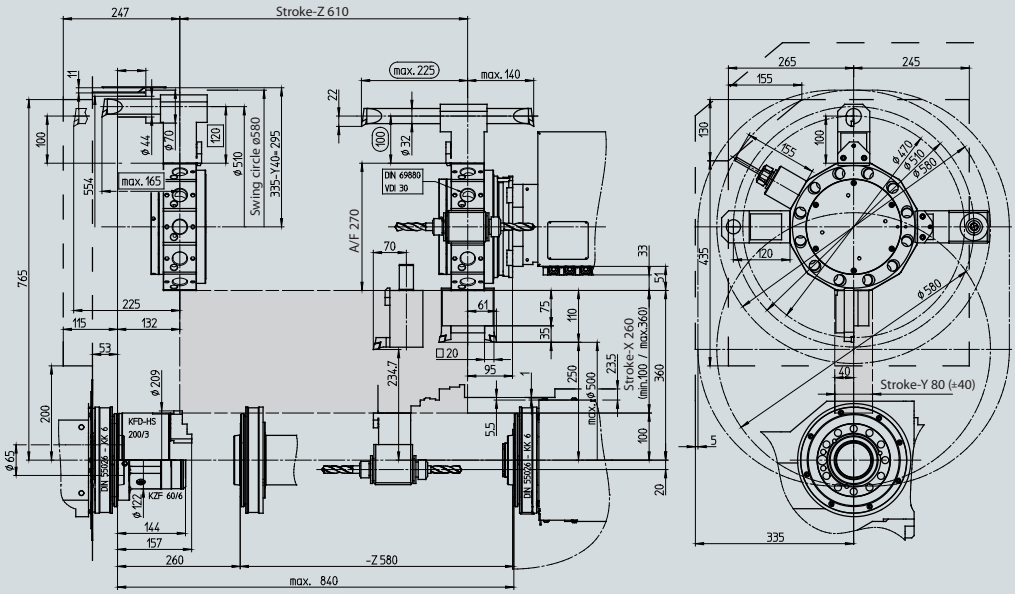


Work area E65 with tailstock - VDI30

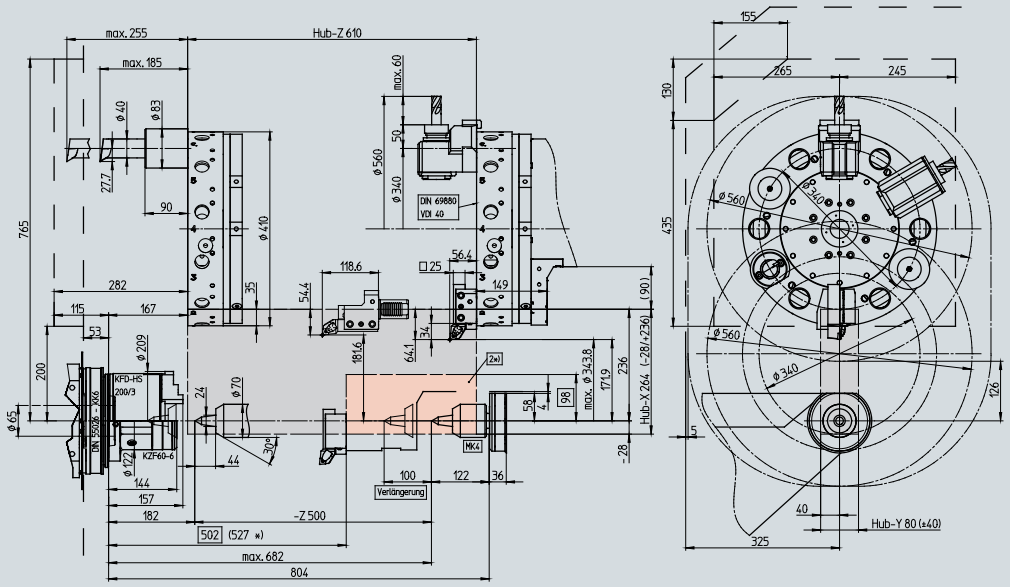


*) Machine without Y-axes
2*) through Software limit switches collision-protected area

Work area E65 with counter spindle - VDI30

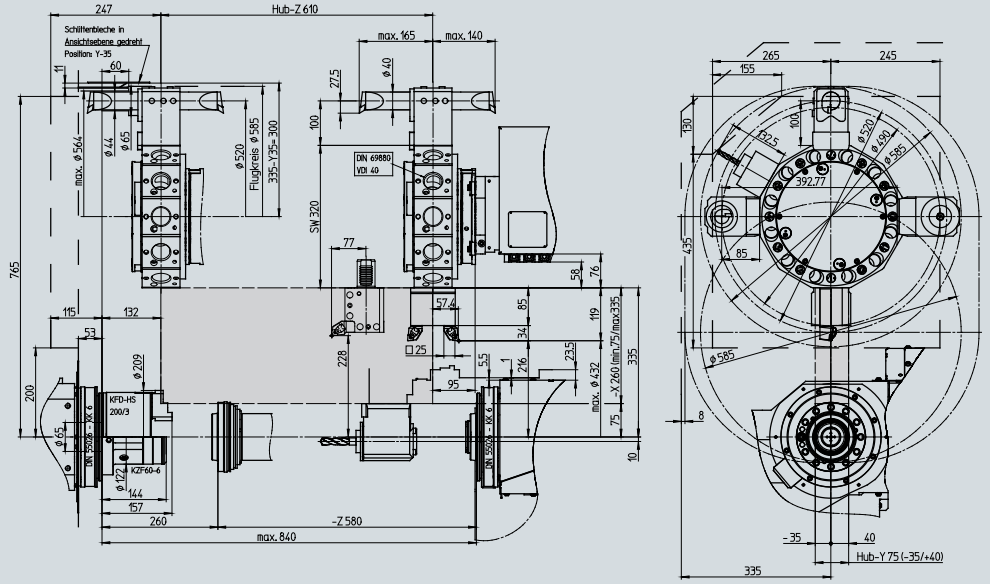


Work area E65 with tailstock - VDI40

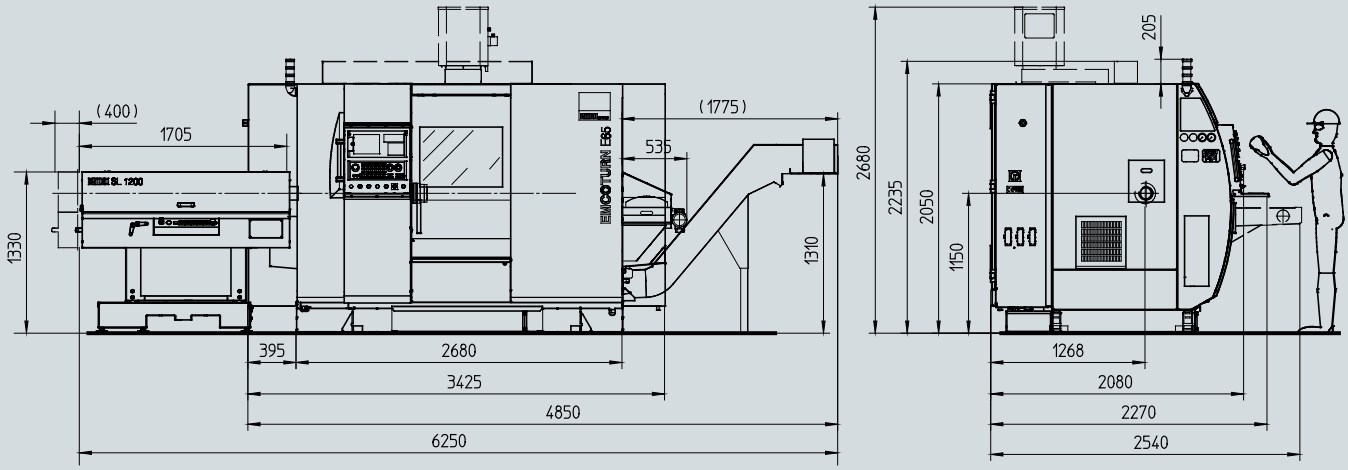


*) Machine without Y-axes
2*) through Software limit switches collision-protected area

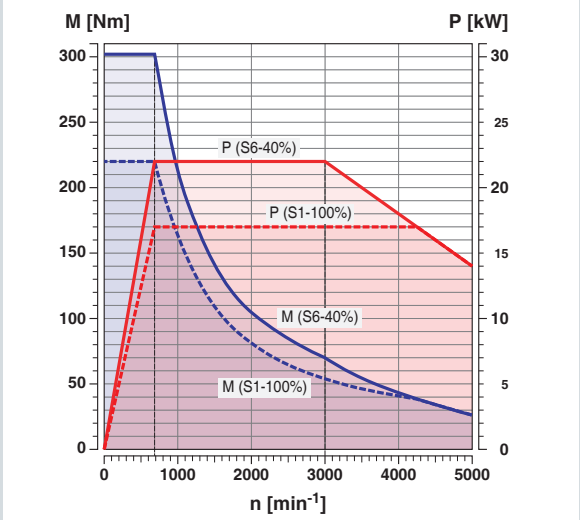
Work area E65 with counter spindle - VDI40



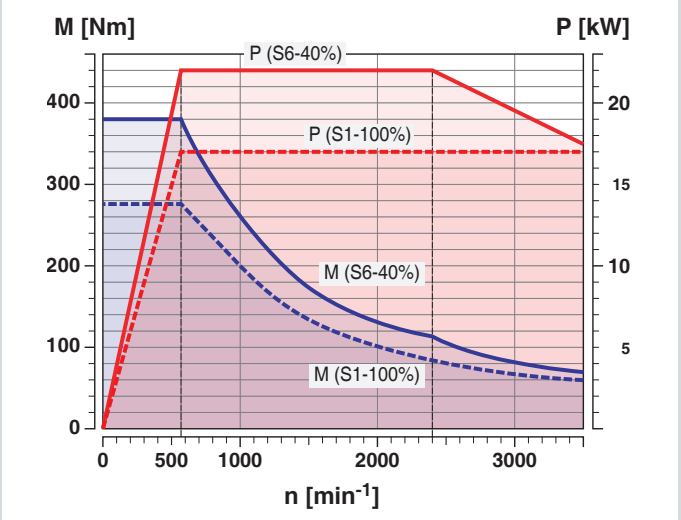
Machine layout E65



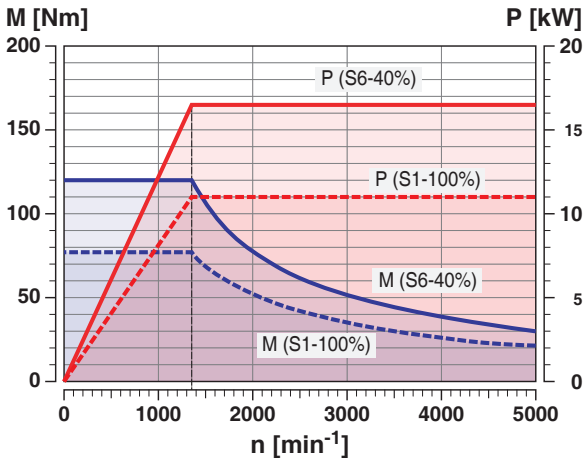
Performance



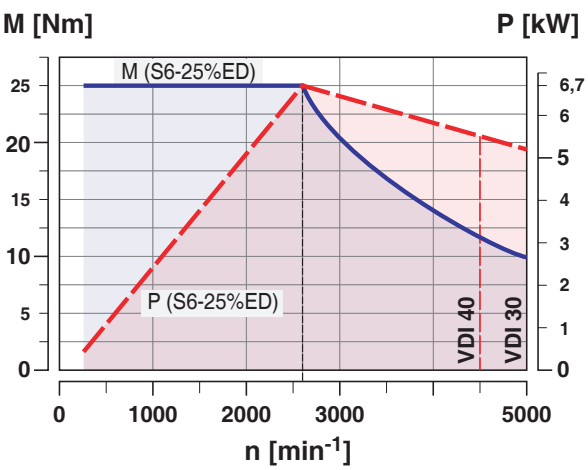
Motor characteristics for main spindle size 65



Motor characteristics for main spindle size 95



Motor characteristics for counter spindle



Tool turret motor charasteristics for driven tools

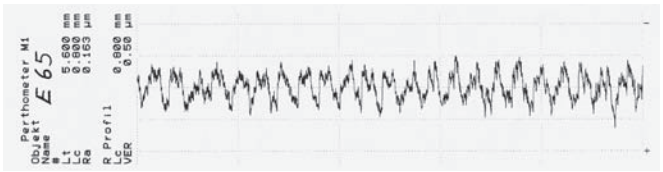
Validated quality

ROUNDNESS AND SURFACE QUALITY

Material:	Brass (Cu Zn 40 Pb 2)
Cutting tool:	Carbide insert CCGX 09 T3 04-AL
Turning diameter:	ø 45 mm
Cutting speed:	300 m/min
Feed rate:	0.025 mm/U
Cutting depth:	0.03 mm

As measured:

Roundness:	0.45 µm
Surface finish:	Ra = 0.163 µm



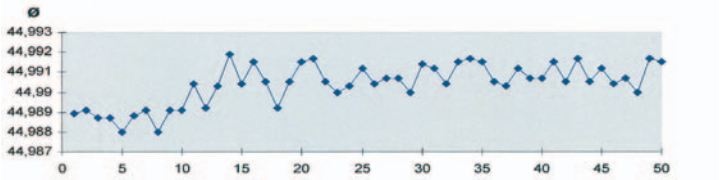
REPEAT ACCURACY

Material:	Steel – 16 Mn Cr 5
Turning diameter:	ø 45 h6
Tolerance:	16 µm
Spindle speed:	2000 rpm
Feed rate:	0.08 mm/rev
Cutting depth:	0.2 mm

Long term machining accuracy: 4 µm

As measured:

Range:	4 µm
Cm value:	2.57



EMCOTURN E65
Technical Data

Work area	
Swing over bed	Ø 610 mm (24")
Swing over slide	Ø 360 mm (14.2")
Distance between centers on tailstock version	682 mm (26.9")
Main spindle / counter spindle distance	840 mm (33.1")
Maximum turning diameter	Ø 500 mm (19.7")
Maximum part length	520 mm (20.5")
Maximum bar diameter	Ø 65 (95) mm (2.6 (3.7"))

Travel	
Travel in X / Z	260 / 610 mm (10.2 / 24")
Travel in Y	80 (+ / –40) mm (3.1 (+ / –1.6)")

Main spindle	
Speed range	0 – 5000 (3500) rpm
Maximum drive power	22 kW (29.5 hp)
Max. torque on the spindle	305 Nm (224.95 ft·lbs) (380 Nm) (280.27 ft·lbs))
Spindle nose DIN 55026	A2-6 (A2-8)
Spindle bearing (inner diameter at front)	105 mm (160 mm) (4.1 (6.3"))
Spindle bore hole	73 mm (105 mm) (2.9 (4.1"))

Counter spindle	
Speed range	0 – 5000 rpm
Maximum drive performance	16,5 kW (22.1 hp)
Max. torque on the spindle	125 Nm (92.19 ft·lbs)
Spindle nose DIN 55026	A2-6
Spindle bearing (inside diameter at front)	105 mm (4.1")
Spindle bore hole	73 mm (2.9")

C-axis	
Round axis resolution	0.001°
Rapid motion speed	1000 rpm

Tailstock	
Tailstock travel	500 mm (19.7")
Maximum thrust	8000 N (1798.4 lbs)
Maximum travel speed	app. 20 m/min (787.4 ipm)
Tailstock bore taper	MT4

Tool turret	
Number of tool positions (all driven)	12
VDI shaft (DIN 69880)	30 mm (40 mm) (1.2 (1.6)")
Tool cross-section for square tools	20 x 20 (25 x 25) mm (0.8 x 0.8 (1 x 1)")
Shaft diameter for boring bars	32 mm (1.3")
Tool change time	0,2 (0,3) sec

Driven tools DIN 5480	
Speed range	0 – 5000 (4500) rpm
Maximum torque	25 Nm (18.4 ft·lbs)
Maximum drive power	6.7 kW (9 hp)

Feed drives	
Rapid motion speed X / Y / Z	30 / 15 / 30 m/min (1181.1 / 590.6 / 1181.1 ipm)
Feed force in the X / Y / Z	5000 / 7000 / 7000 N (1124 / 1573.6 / 1573.6 lbs)
Feed force in the Z2 axis (counter spindle)	8000 N (1798.4 lbs)
Positioning scatter Ps VDI 3441 in X / Y / Z	2 / 2 / 2 µm *

Coolant system	
Tank volume (optional)	230 (830) liters (50 gal (180 gal))
Coolant pressure (optional)	3.5 (14 / 25) bar
Pump power (optional)	0.57 (2.2 / 3) kW (0.76 (2.95 / 4) hp

Power consumption	
Connected load	25 kVA
Compressed air	6 bar (87 PSI)

Dimensions and weight	
Height of spindle center above floor	1150 mm (45.3")
Machine height	2100 mm (80.7")
Machine footprint L x D	3480 x 2080 mm (137 x 81.9")
Total weight	approx. 6500 kg (14330 lb)

EMCO SL1200	
Bar length	250 – 1100 mm (9.8 – 43.3")
Bar diameter	Ø 8 – 51 mm (0.3 – 2.0")
Material support	approx. 560 mm (22.0")
Length	1700 mm (66.9")
Width	1250 mm (49.2")
Height (Spindle center)	1090 – 1380 mm (42.9 – 54.3")
Weight approx.	approx. 500 kg (1102.3 lb)

Safety devices	CE compliant

* For machines including laser measurement and pitch error compensation

EMCO GmbH
Salzburger Str. 80 · 5400 Hallein-Taxach · Austria
T +43 6245 891-0 · F +43 6245 86965 · info@emco.at · www.emco-world.com