emco group

Designed for your profit

EMCOTURN E45

CNC turning center for bar stock work up to Ø 45 (51) mm and chucking work

TURNING

EMCO-WORLD.COM

The EMCOTURN E45 in the tailstock version

Perfect European engineering, superbly equipped with a Y axis, 200 mm more machining length, C axis, driven tools with a 4 kW drive performance and a choice of a Siemens, Fanuc or Heidenhain control unit. A cost-effective bar loader package or an integrated automation solution is available on request.

1 WORK AREA
- Plenty of open space
- Straight chip fall
- Top ergonomics

2 TOOL TURRET
- 12 stations VDI 30 axial
- 6 stations driven
- Tapping without length compensation
- Polygonal turning, engraving, etc.

3 SPINDLE
- High drive performance
- Thermoresistant construction
- Large speed range
- A2-5 spindle connection
- Bar capacity Ø 45 (51) mm

4 CONTROL UNIT
- 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

Machine with optional equipment

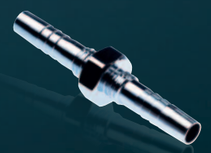
5 SHELF
- Space for measuring devices and operating tools
- Optional for the Sinumerik PC keyboard

6 Y-AXIS
- Travel +40 / –30 mm
- 90° implemented in the machine construction
- Large distance between guide rails
- Stable and compact construction, without restrictions

7 MACHINE HOUSING
- Comprehensive protection against chip flying
- 100% coolant-leakproof
- Large door safety glass
- Free view into the workroom
- Built-in buttons make it easier to operate the machine
- Easy to clean the coolant tank

Threaded bolt
(Heat treatable steel)

Fitting
(Steel)



Socket
(Stainless steel)

Pin guide
(Heat treatable steel)

The EMCOTURN E45 in the counter spindle version

The EMCOTURN E45 SMY. The perfect solution for economic, off-the-shelf complete machining. Fitted with a counter spindle, driven tools, a high-precision C axis and extremely fast rapid motion speeds, the EMCOTURN E45 SMY gives you everything you need for manufacturing complex turned-milled parts efficiently and at a low price. The highlight of the machine is its very stiff Y axis with long travel – for almost unlimited machining capabilities with maximum precision.

1 WORK AREA
- Plenty of open space
- Straight chip fall
- Top ergonomics

2 TOOL TURRET
- 12 stations VDI 25 radial
- 12 stations driven
- Servo controlled with adjustable swivel speed
- Tapping without length compensation
- Polygonal turning, engraving, etc.

3 SPINDLE
- High drive performance
- Thermoresistant construction
- Large speed range
- A2-5 spindle connection
- Bar capacity Ø 45 (51) mm

4 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

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

Machine with optional equipment

6 CONTROL UNIT
- 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

7 SHELF
- Space for measuring devices and operating tools
- Optional for the Sinumerik PC keyboard

8 Y-AXIS
- Travel +40 / –30 mm
- 90° implemented in the machine construction
- Large distance between guide rails
- Stable and compact construction, without restrictions

9 MACHINE HOUSING
- Comprehensive protection against chip flying
- 100% coolant-leakproof
- Large door safety glass
- Free view into the workroom
- Built-in buttons make it easier to operate the machine
- Easy to clean the coolant tank

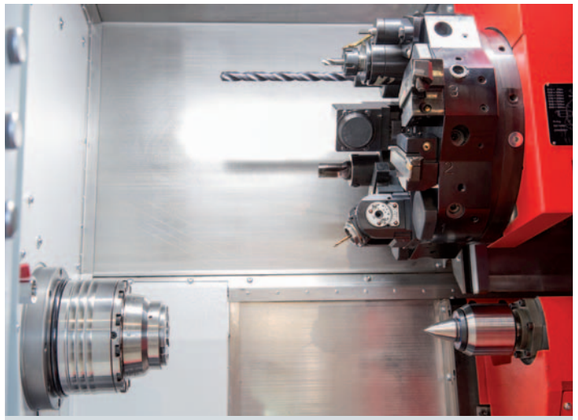
10 FINISHED PARTS CONVEYOR
- Large storage capacity
- Automatical indexing
- Incl. chip drawer

Distributor (Brass)

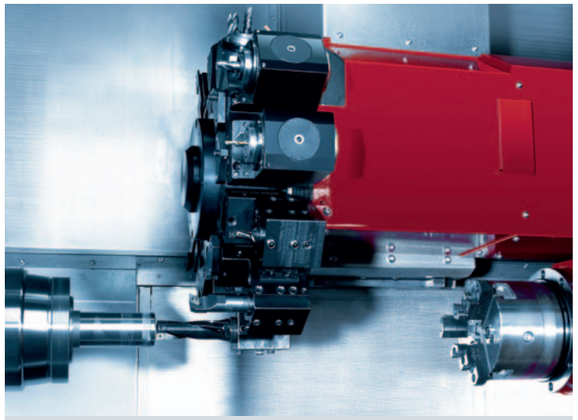
Camshaft (Brass)

Eccentric disc (Aluminium)

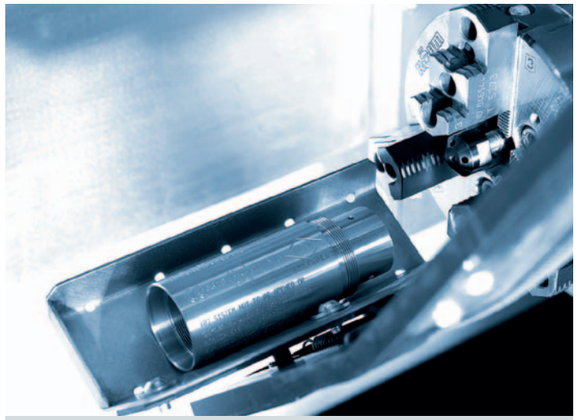
Push-on contact (Steel)



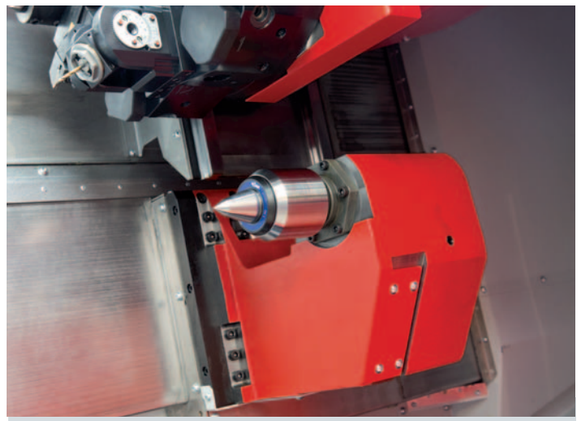
Tooling system. 12-station axial style tool turret VDI30 with two bolt hole circles. The outer for the stationary tools, the inner one for up to 6 driven tool. No tool rise, interconnection with directional logic. Switches with bidirectional logic DIN 5480 coupling.



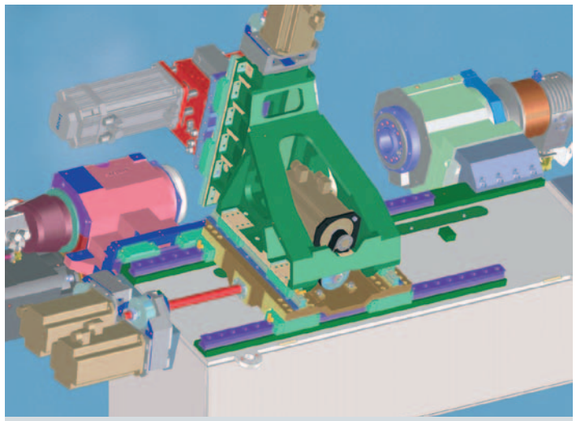
Tool head. 12-position VDI 25 radial turret with single-motor engineering. A servo motor powers the driven tools and the swivel movement. No tool rise. Switches with bidirectional logic. Every station can hold driven tool holders with a DIN 5480 coupling.



Counter spindle and parts catcher. The counter spindle includes a parts ejector with stroke monitoring and coolant feed. It ejects the parts automatically into the parts catcher, which then removes them from the machine and stores them in a bin or on an accumulating conveyor.



Tailstock. On the EMCOTURN E45 with tailstock, the tailstock is set up on the linear roller slide and can be automatically positioned within a range of 510 mm. The live center is integrated into the body of the tailstock and can be removed using a pressure wedge.



Y-axis. The Y-axis is integrated into the basic machine structure and stands at 90° to the X-axis. Extremely short projections form the basis for solid turning and drilling operations, as well as milling operations without interference contours.

EMCOTURN E45
Technical Highlights

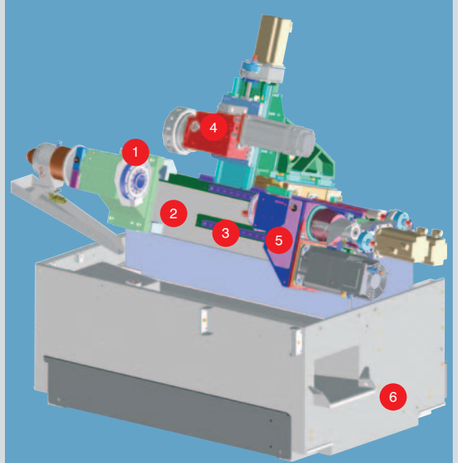
Highlights

- Powerful driven tools
- Y-axis for complexe milling operations
- Counter spindle for complete machining
- 200 mm more working length for shafts
- Flexible automatic tailstock
- Top thermostability
- 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
- A2-5 spindle nose
- Bar capacity diameter 45 mm (51) 1.8"(2.0")

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

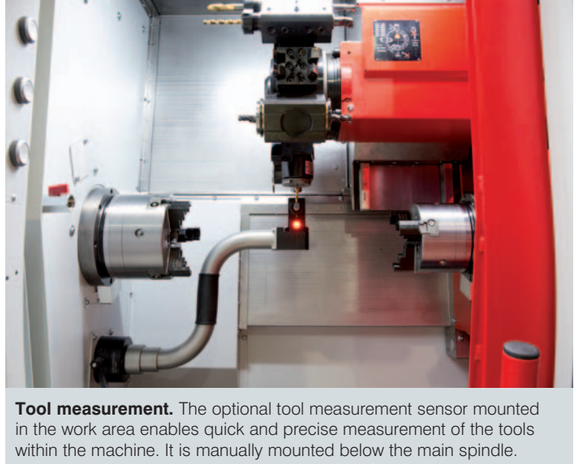
3 ROLLER GUIDES
- In all linear axes
- Preloaded
- No backlash in any direction of force
- High rapid motion speeds
- No wear
- Minimal lubrication



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
- A2-4 spindle nose

6 MACHINE STAND
- Thermally isolated from the machine base
- Coolant container that is larger and easier to clean
- 100% sealed against coolant leaks



Tool measurement. The optional tool measurement sensor mounted in the work area enables quick and precise measurement of the tools within the machine. It is manually mounted below the main spindle. After use, it is placed in a storage area at the left machine cover.

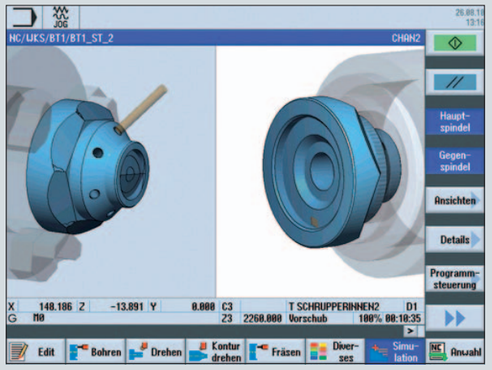
Tool measurement sensor storage niche. Protected storage area for the tool measurement sensor and setting gauge.

The CNC control unit:
The brains of each CNC lathe

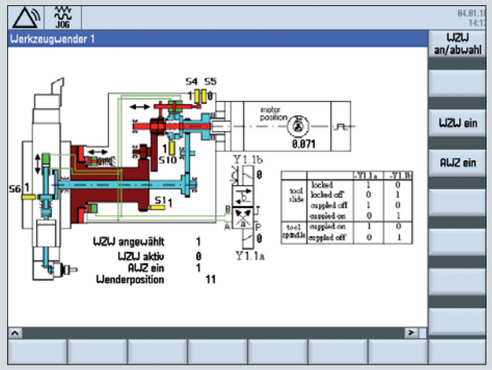
Machine tools are facing ever-increasing requirements. They are supposed to be ever faster, ever more precise and ever more user-friendly!
Nowadays, these criteria are met by modern CNC control units. What is new, however, is the wish for networking, something that the state-of-the-art controls included in EMCO‘s machine tool program are capable of. Many customers are asking for standardized control units within their production. In order to cater for these needs, the EMCOTURN E45 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.



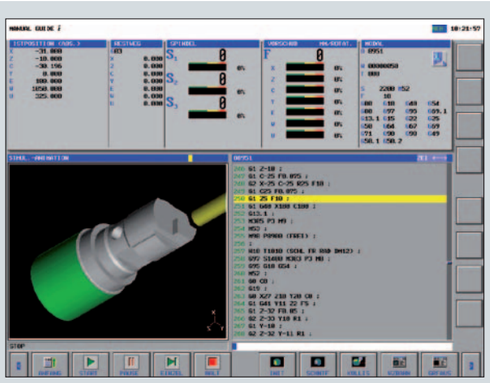
3D simulation



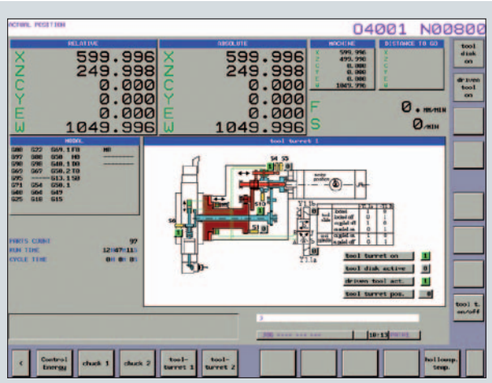
EMCO diagnostic images

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.



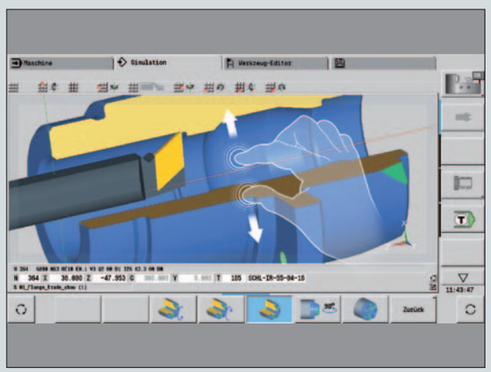
3D simulation



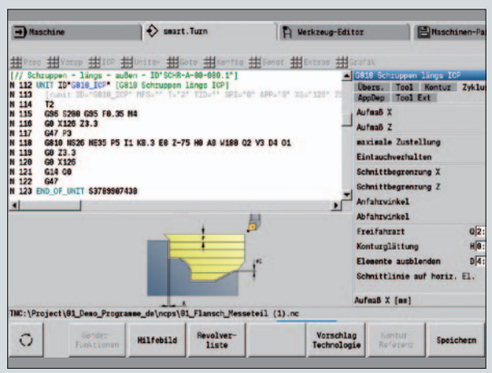
EMCO diagnostic images

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



SmartTurn programming assistant

EMCO swing loader. The integrated solution.

Tailor-made solutions. For preformed blanks and parts with a diameter larger than the spindle capacity, we offer an integrated swing loader for fully automated loading and part removal. This has been designed to form a harmonious single entity with the machine. The machine control system takes care of positioning. A short bar loader and a 3-meter bar loader are available from EMCO for workpieces from bar stock.

1 **SWING LOADER**

2 **STORAGE CONVEYOR BELT**

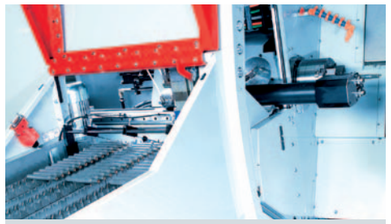
3 **GRIPPER**

Advantages

- Fully automated loading and unloading of the workpieces
- Short loading and unloading time
- Flexible for shaft or flange parts
- Oriented loading into the clamping device
- Simple programming via the Sinumerik control
- CNC-controlled movements

Maximum output – Minimum space required.

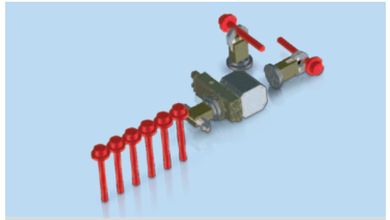
The EMCO swing loader is a universal loading system for all types of preformed blanks. It can be customized individually to the customer's requirements using numerous gripper and handling systems. How we do it: we standardize the components but create a customized solution. The result: a custom-tailored machine for the same price as a standard unit.



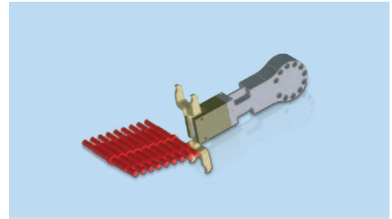
Integrated swing loader. The integrated EMCO swing loader can pick-up the raw part from the feeding system and transfer it through the little door at the side into the machine.

Finished parts. The finished parts mostly are unloaded gently with the partscatcher on to a conveyor.

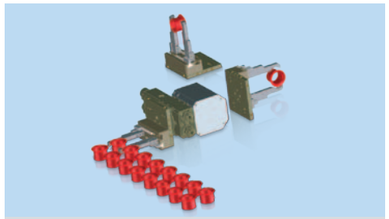
Loading of the blank into the main spindle. The blank is mostly positioned against a stop in the clamping device and then clamped. Shaft parts may also be clamped in collet chucks or between centres.



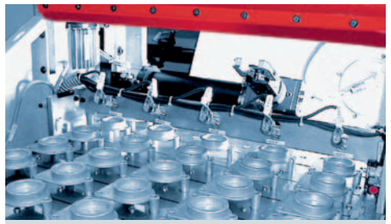
2-finger gripper with 180° rotary module for loading blanks fed in vertically



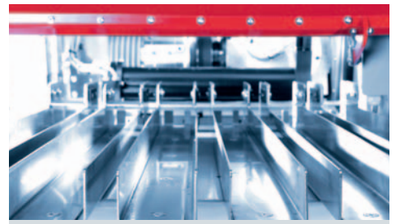
2-finger toggle lever gripper for loading shaft parts



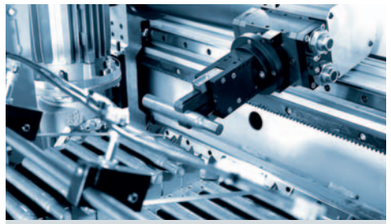
Parallel grippers with 180° rotary module for loading shaft parts (1st and 2nd chucking)



Large storage capacity chain feeding system for loading preformed blanks with the correct orientation.



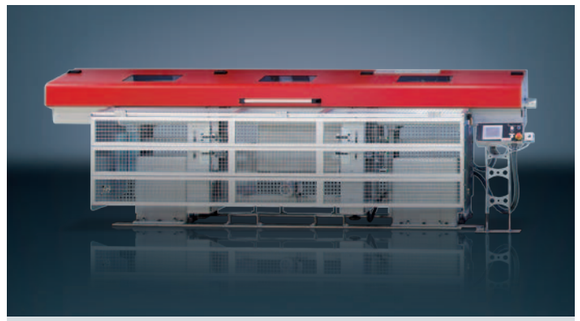
Multiple infeed chutes for loading rotationally-symmetrical blanks. The length of the blanks determines the number of infeed chutes.



Chain feeding system with V-supports for preformed shaft parts of various shapes.

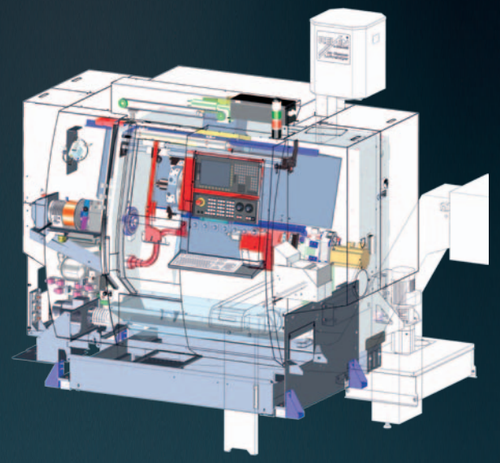
EMCO bar loaders

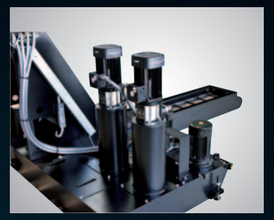
EMCO short bar loader. Faced by ever-increasing pressure on floorspace for machines, EMCO has developed the most compact short loader on the market: the EMCO SL 1200.



EMCO TOP LOAD. For fully automated loading of 3-meter bar material into the machine. Multi-Level material overlays allow an even longer unmanned operation.

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

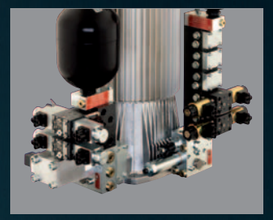
Hydraulically activated clamping cylinders and chucks guarantee the precise, safe clamping of workpieces. Programmable sensors are used for stroke monitoring. There is no need for time-consuming adjustments of contactless limit switches.

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.

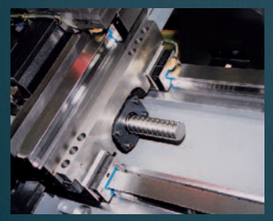
Headstocks

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.



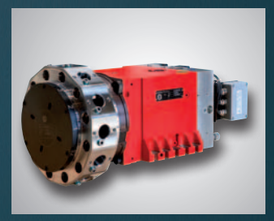
Hydraulic systems

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.



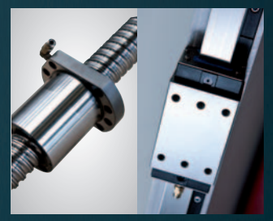
Machine bases and slides

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.



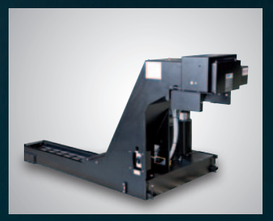
Tool turret

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]

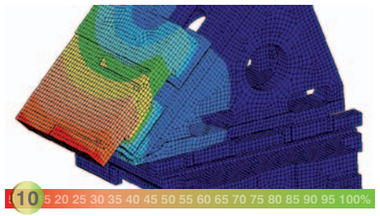
Thanks to its accumulator charging system, the pump only runs when required. If the pressure accumulator is full, the pump switches over to closed loop circulation.
Savings of up to 90%

[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%

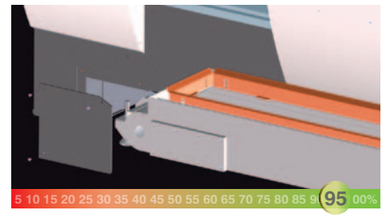


[Highly efficient motors]

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%

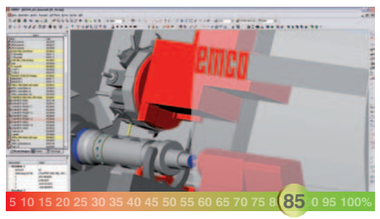


[Intelligent standby concepts]

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%

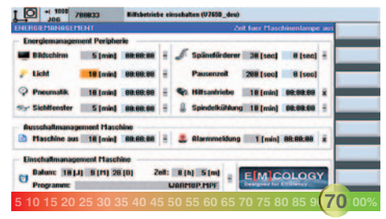
[Virtual machine]

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%



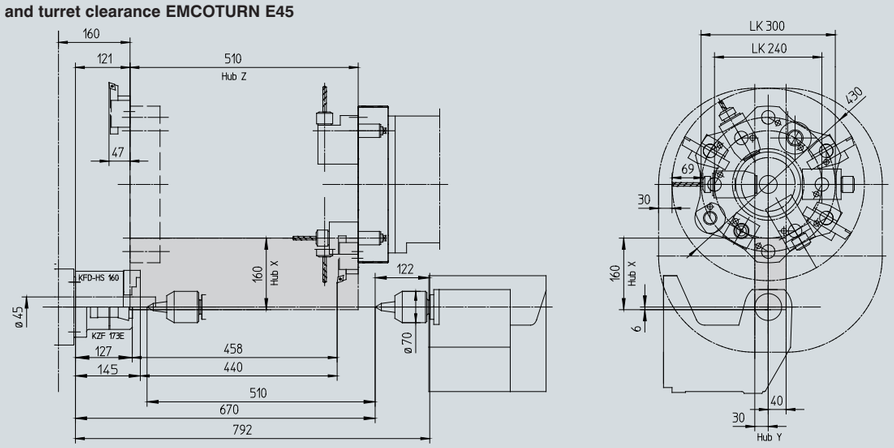
[Intelligent energy management]

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



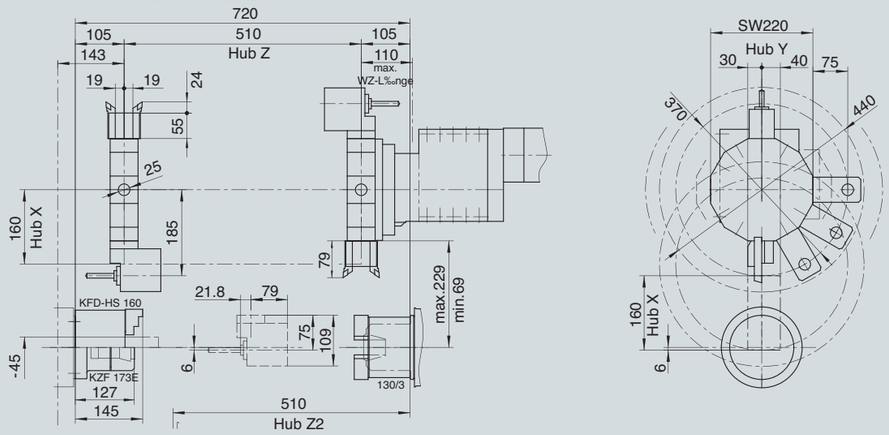
Work area EMCOTURN E45 with tailstock

Work area and turret clearance EMCOTURN E45



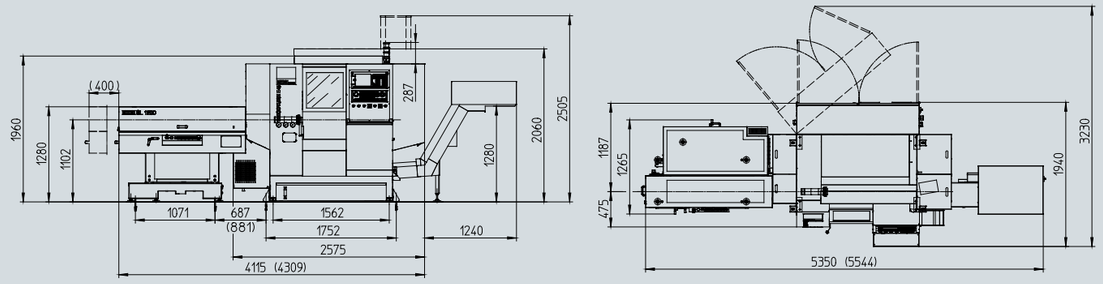
Work area EMCOTURN E45 with counter spindle

Work area and turret clearance EMCOTURN E45

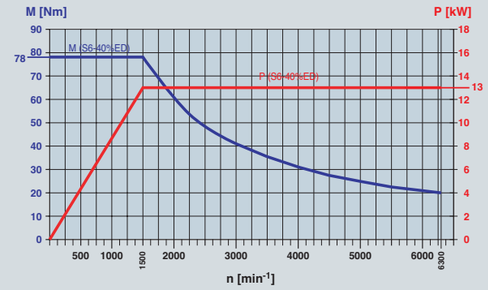


Installation plan

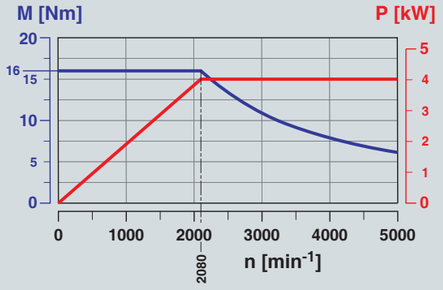
EMCOTURN E45 with EMCO SL1200



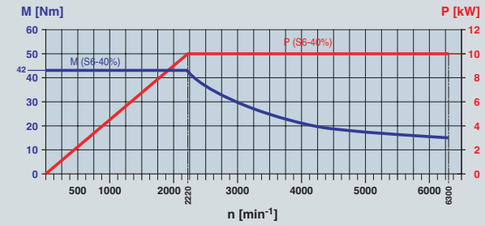
Performance



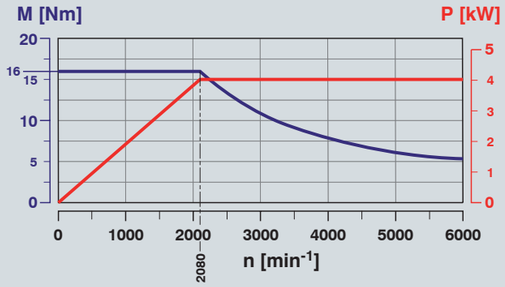
Motor characteristics for main spindle



Motor characteristics for axial tool turret VDI30



Motor charasteristics for counter spindle



Motor characteristics for radial tool turret VDI25

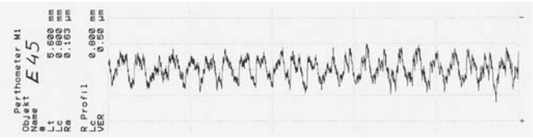
Validated quality

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/rev
Cutting depth:	0.03 mm

As measured:

Roundness:	0.45 µm
Surface finish:	Ra = 0.163 µm



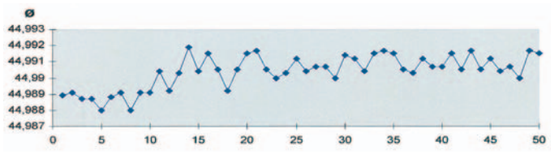
REPEAT ACCURACY

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 E45
Technical Data

Work area	
Swing over bed	430 mm (16.9")
Swing over cross slide	300 mm (11.8")
Distance between centers	670 mm (26.4")
Distance between spindle noses f. counter spindle version	720 mm (28.34")
Max. turning diameter with axial turret with radial turret	220 mm (8.7") 300 mm (11.8")
Maximum part length	480 mm (18.9")
Maximum bar-stock diameter	Ø 45 (51) mm (1.77")

Travel	
Travel in X / Z	160 / 510 mm (6.3" / 20.1")
Travel in Y	+40 / –30 mm (+1.6" / -1.2")

Spindle	
Speed range	0 – 6300 (5000) rpm
Spindle torque	78 (100) Nm (57.5 ft/lbs)
Spindle nose DIN 55026	A2-5
Spindle bearing (inner diameter at front)	80 mm (3.1")
Spindle bore	53 mm (2.1")

Counter spindle	
Speed range	0 – 6300 rpm
Spindle torque (Siemens / Fanuc / Heidenhain)	42 / 43 Nm (31 / 31.7 ft/lbs)
Spindle nose DIN 55026	A2-4
Spindle bearing (inner diameter at front)	70 mm (2.8")

C-axis	
Resolution	0.001°
Rapid motion speed	1000 rpm
Spindle indexing	0.01°

Automatic tailstock	
Travel	510 mm (20.1")
Quill thrust	6000 N (1348.8 lbs)
Maximum travel speed	ca. 20 m/min (787.4 ipm)
Quill bore taper	MT4

Drive Power	
Main spindle	13 kW (17.4 hp)
Counter spindle (Siemens / Fanuc / Heidenhain)	10 / 7,5 kW (13.4 / 10.1 hp)

Tool turret axial / radial	
Number of tool positions	12 / 12
Tool holding shaft in accordance with (DIN 69880)	30 / 25
Tool cross-section for square tools	20 x 20 / 16 x 16 mm (0.78 x 0.78 / 0.62 x 0.62")
Shank diameter for boring bars	Ø 32 / Ø 25 mm (1.25 / 0.98")
Turret indexing time	0.14 sec

Driven tools DIN 5480 axial / radial	
Number of stations	6 / 12
Drive performance	4 / 4 kW (5.4 / 5.4 hp)
Maximum torque	16 / 16 Nm (11.8 / 11.8 ft/lbs)
Speed range	0 – 5000 / 0 – 6000 rpm

Feed drives	
Rapid motion speed X / Y / Z	24 / 10 / 30 m/min (944.9 / 393.7 / 1181.1 ipm)
Feed force in the X / Y axes	4000 / 4000 N (899.2 / 899.2 lbs)
Feed force in the Z-axes	6000 N (1348.8 lbs)
Acceleration from 0 to rapid speed X / Z	0.1 sec
Position variation Ps (according to VDI 3441) X / Y / Z	2 / 2 / 2 µm*

Coolant system	
Tank volume	250 liters (66 Gal)
Pump performance	0.57 (2.2) kW 0.77 (3 hp)
Pump power (optional)	3.5 (14 / 25) bar

Power consumption	
Connected load value	25 kVA
Air pressure required	6 bar

Dimensions	
Height of center above floor	1100 mm (43.3")
Machine height	1960 mm (77.2")
Required space for machine L x D	2575 x 1760 mm (101.4 x 69.3")
Total weight of the machine Tailstock / Counter spindle	3300 / 4000 kg (7275 / 8818 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