

emcogroup

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 BAR LOADER PACKAGE

- Short bar loader
- Parts catcher
- Interface
- Machine signal lamp
- Set of adapter sleeves

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



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

- Ergonomically placed
- 90° pivot
- Sinumerik 828D / 10,4" or Fanuc 0i-TF / 15"

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



Adjuster 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

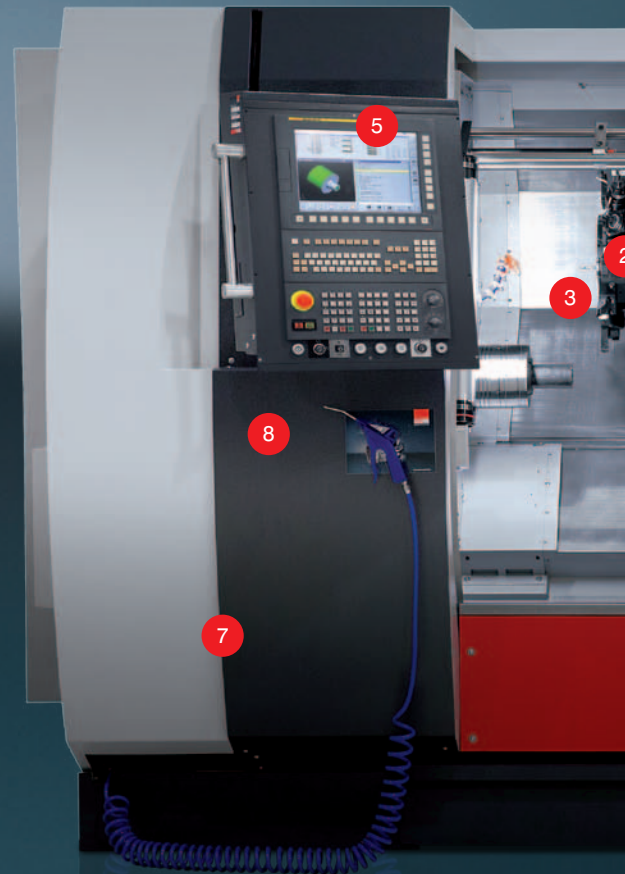
- 12-position VDI30 (VDI40) radial
- 12 driven tool stations
- Servo-controlled
- Rigid tapping
- Polygonal turning, gear-cutting, etc.

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



Carrier
(Heat-treatable steel)



Chain wheel adapter
(Aluminium)

the 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.



5 CONTROL

- Ergonomically placed
- 90° pivot
- Sinumerik 828D / 10,4" or Fanuc 0i-TF / 15"

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

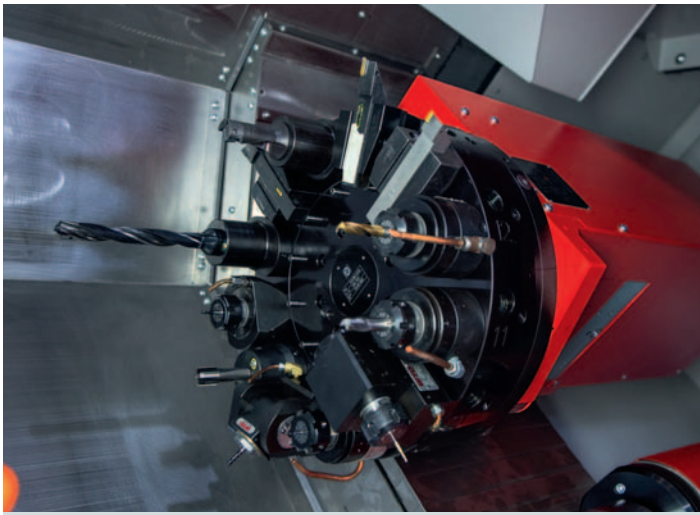
- Hydraulic system
- Lateral arrangement of the hydraulic valves
- Very good accessibility
- Automatic setting of the pressure switches
- Programmable clamping pressure – optional



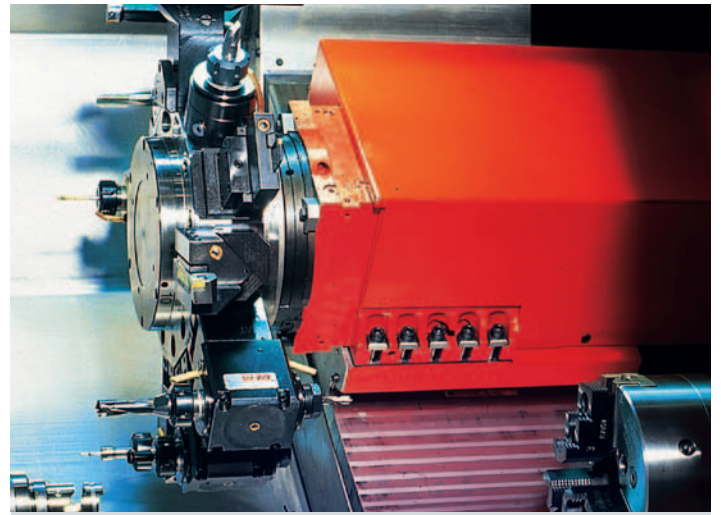
Eccentric disc
(Aluminium)



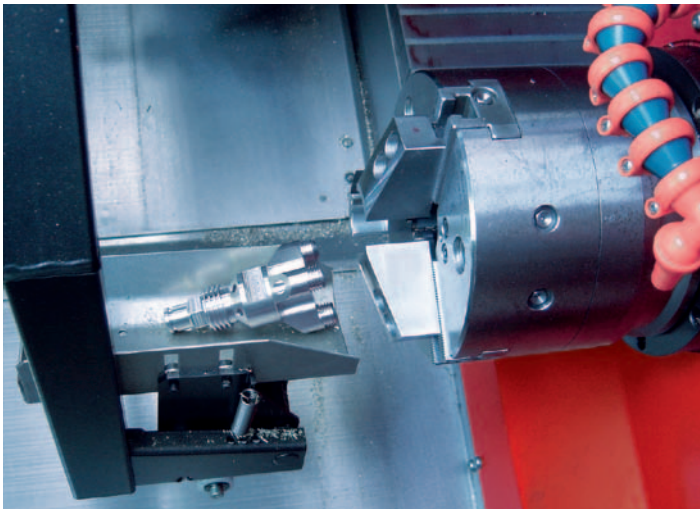
Distributor
(Steel)



Axial tool turret for the tailstock version. Quick 12-fold servo turret with very short indexing times for standardised 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.

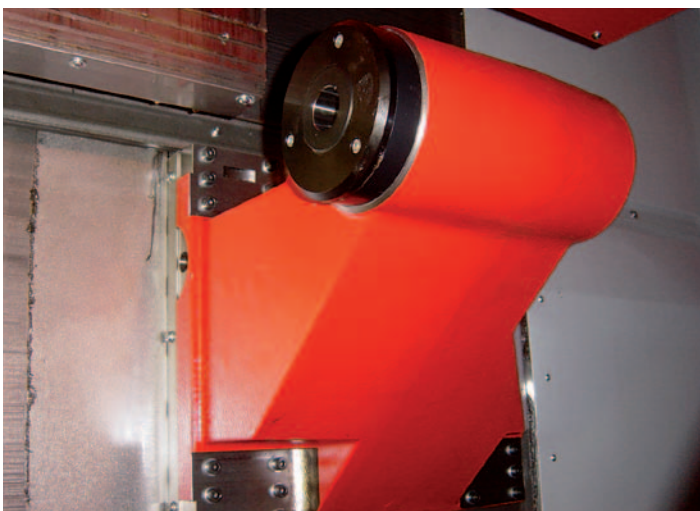


Radial tool turret for the counter spindle version. Quick 12-fold servo turret with very short indexing times for standardised VDI30 or VDI40 tools. Angular holders equipped with ground alignment plates. No additional time consuming alignment necessary. All stations are driven and the indexing speed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

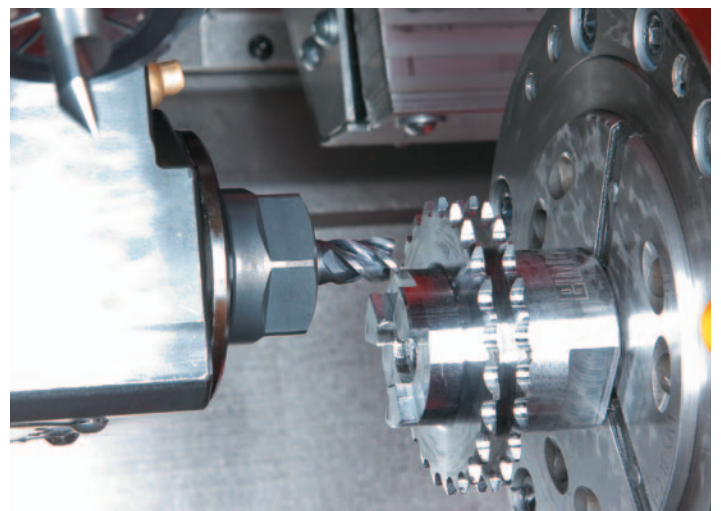


Part pick-up device. Finished parts are transported from the main and counter spindle to the finished parts holder with the part pick-up device. This proven EMCO concept with the pivoting pick-up tray ensures optimum accessibility to the work area, free chip flow and the gentle removal of the finished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

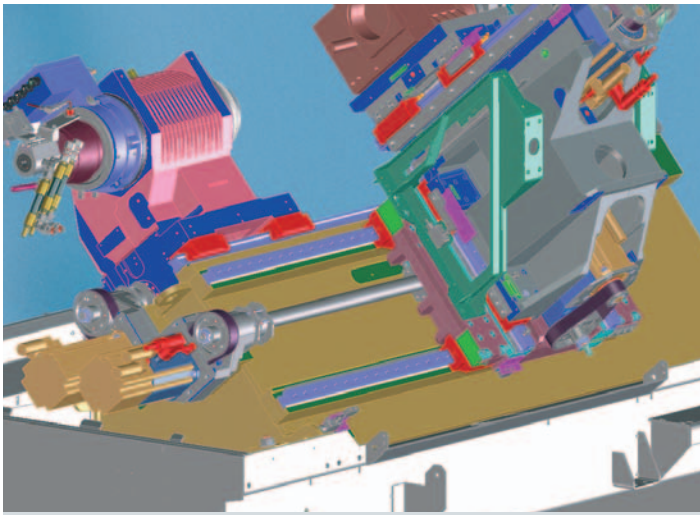
EMCOTURN E65 Technical



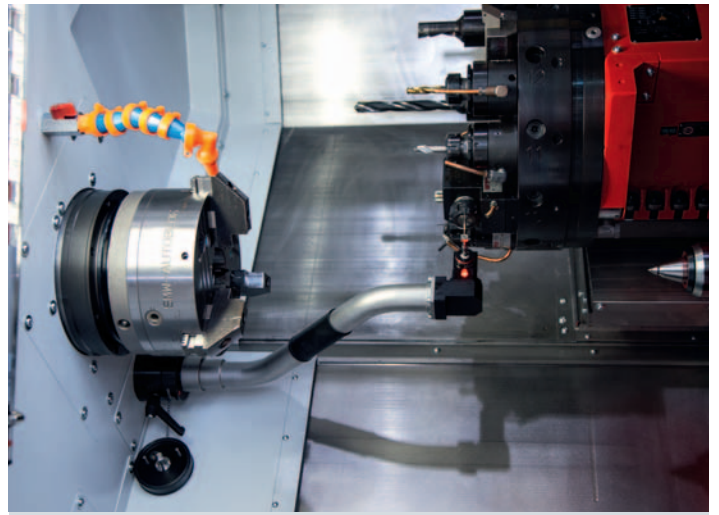
Tailstock. In order to support slim components, the EMCOTURN E65 includes a fully automatic tailstock. It is hydraulically moved over a length of 500 mm. The centre with MT4 cone is directly included in the tailstock body. This ensures compactness and highest stability.



Counter spindle. In the EMCOTURN E65 S version, an adequate high-performance counter spindle offers the prerequisite for complete machining. After processing, the finished parts are pushed into the collection container and removed.



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



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.

Highlights

Highlights

- Powerfull 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 or Fanuc incl. ShopTurn or ManualGuide i
- Made in the Heart of Europe



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



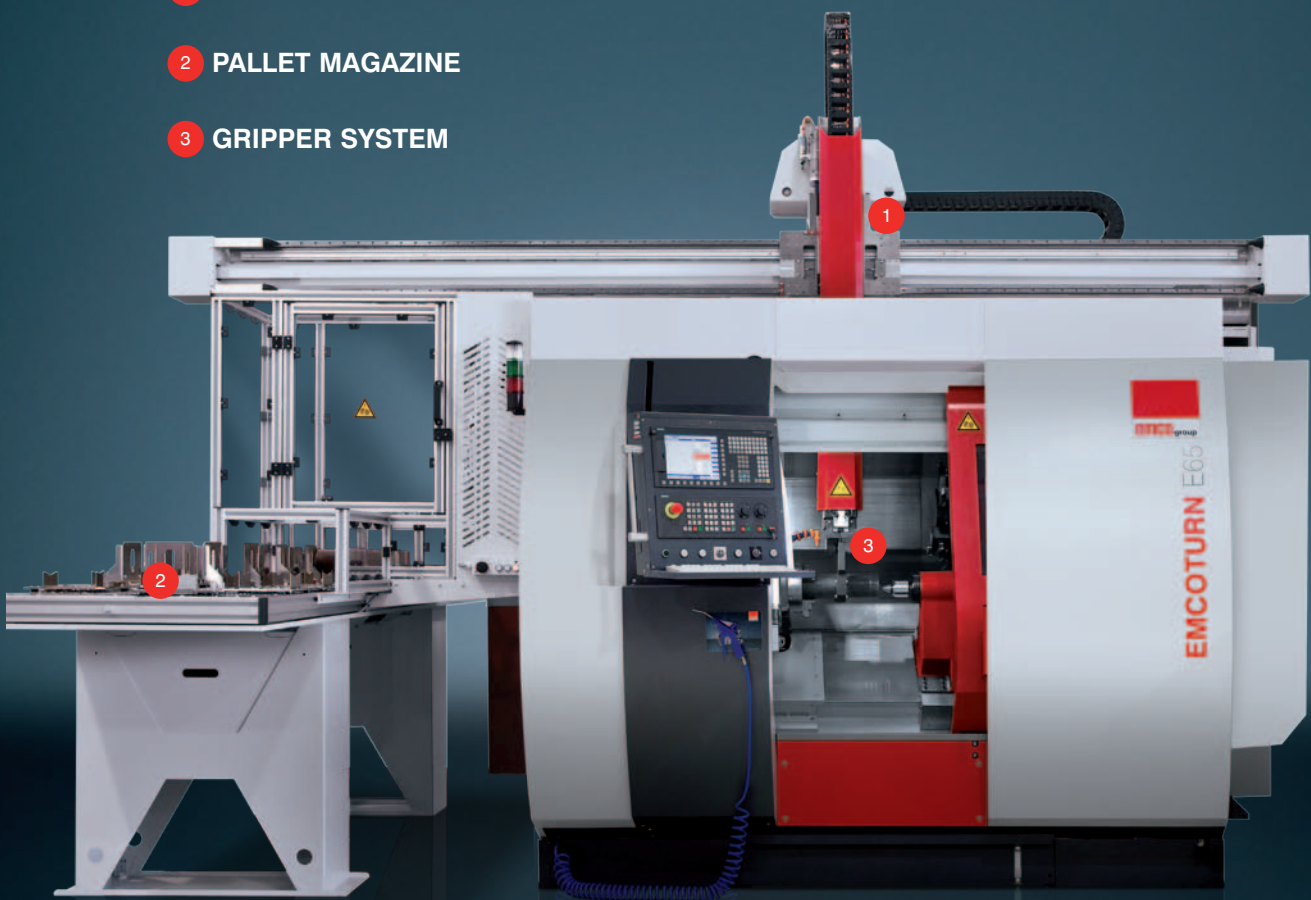
Finished part conveyor. The finished-part pick-up device puts the parts on an accumulating conveyor. A discontinuous belt ensures that the often very complex parts do not fall onto each other.

The EMCO gantry loader. Individual process optimization.

1 GANTRY LOADER

2 PALLET MAGAZINE

3 GRIPPER SYSTEM



Advantages

- Fully automatic 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 spare time due to a load

Automatic Return on Investment

Workpiece magazine

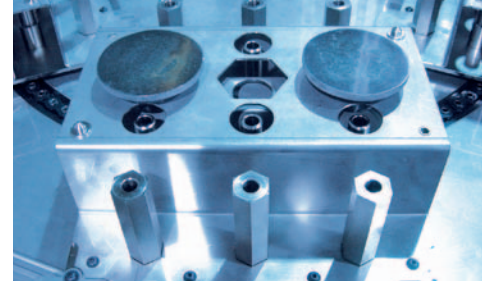
Blank-specific pallet attachments enable oriented loading of blanks into the machine and increase the parts stock for unmanned production. Changeover times are reduced or eliminated thanks to the perfect adjustment to the customer's parts.



4-station pallet attachment for tees



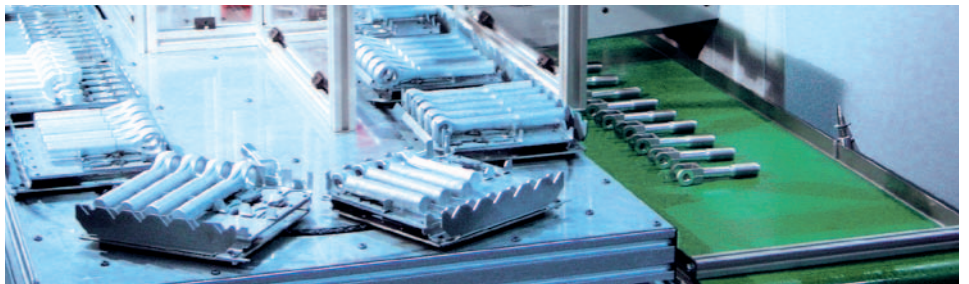
6-station pallet attachment for articulated brackets



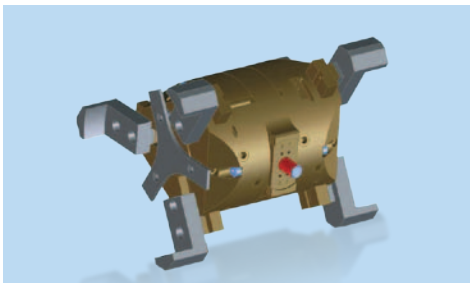
Multi-pallet attachment for a family of parts



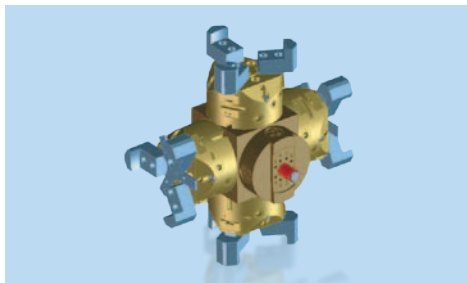
4-station pallet attachment for valve caps



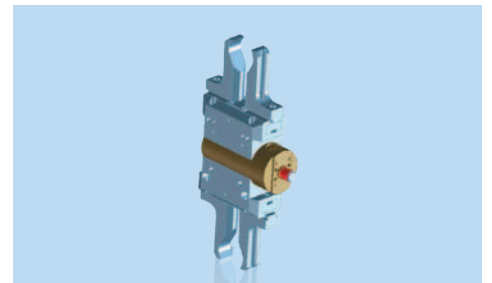
20-station pallet magazine with customer-specific pallets



2 x 3-jaw double gripper head



4 x 3-jaw gripper head

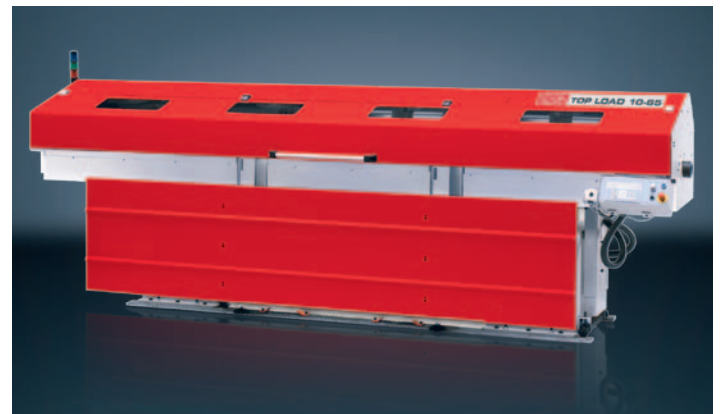


Shaft gripper head

EMCO Bar loader

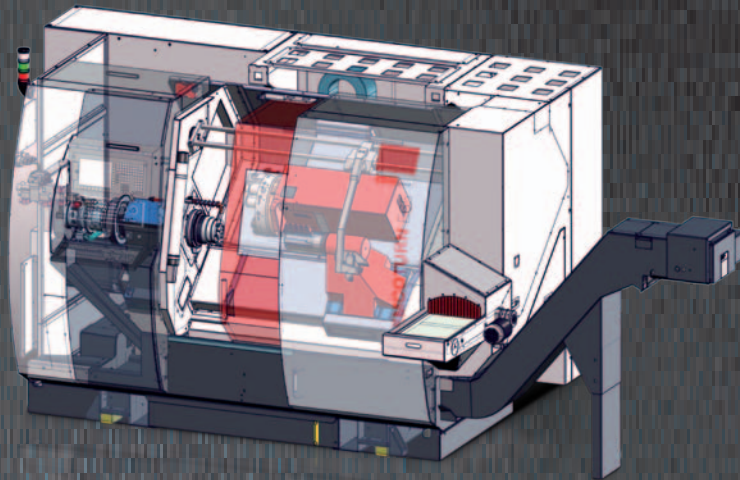


EMCO short bar loader. In view of the ever-increasing pressure on floorspace for machines, EMCO has developed the most compact short loader on the market: the EMCO LM1200.



EMCO Top Load 10-65. 3-metres of bar material may be loaded into the machine in a fully automated way. Multi-Level material supports enable unmanned operation for an even longer period of time.

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 work pieces. 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.



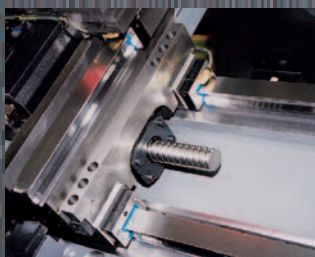
Headstocks

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.



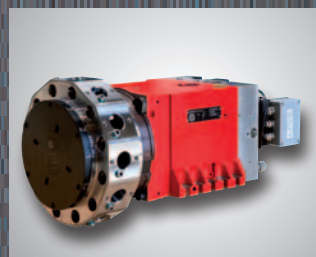
Hydraulic systems

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.



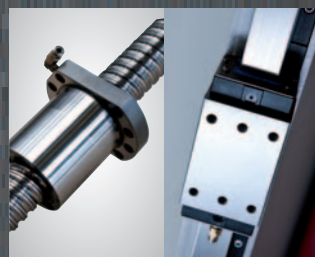
Machine bases and slides

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.



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%



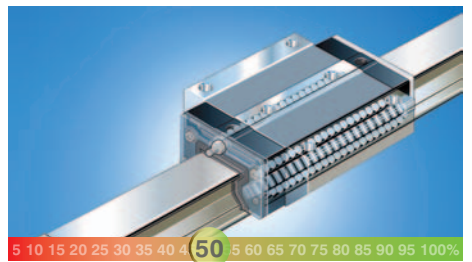
[Compact hydraulics unit with pressure accumulator]

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%



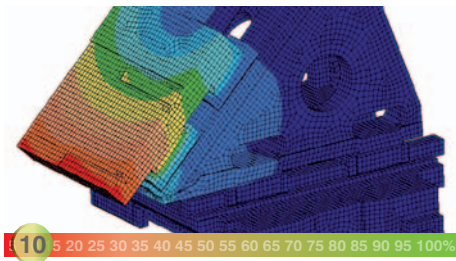
[Roller guides]

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%



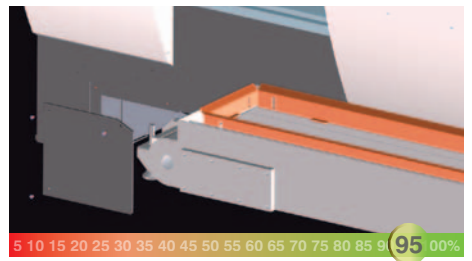
[Highly efficient motors]

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%



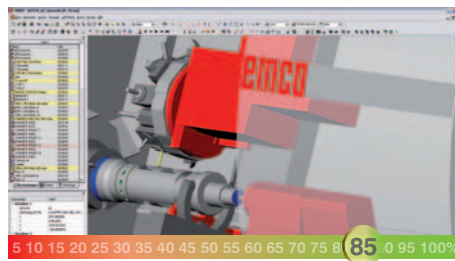
[Intelligent standby concepts]

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%



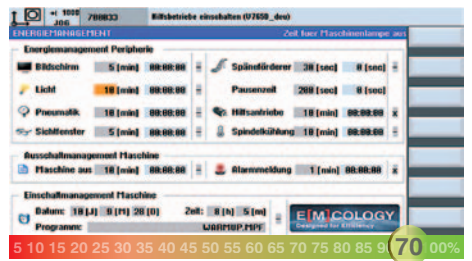
[Virtual machine]

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%

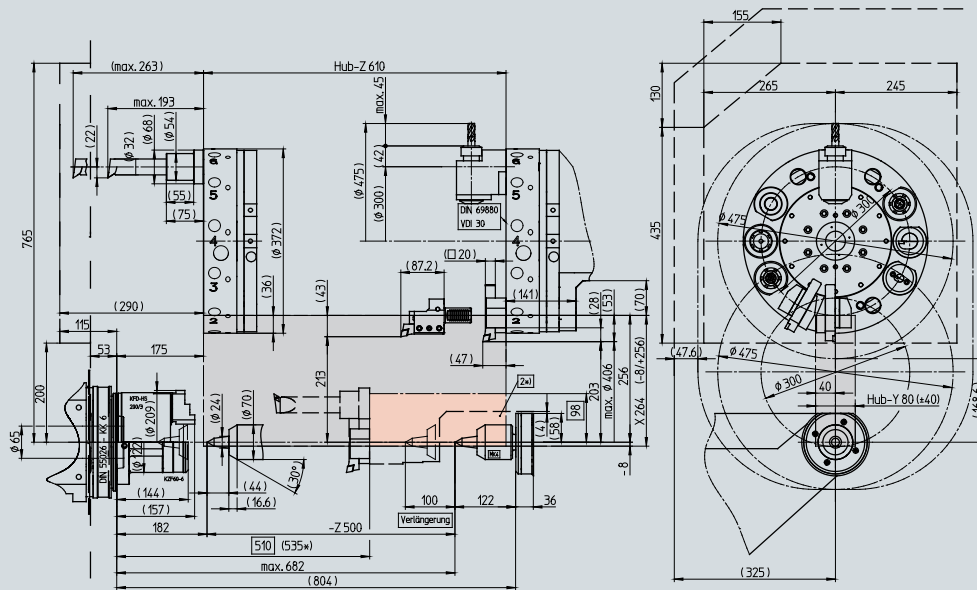


[Intelligent energy management]

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

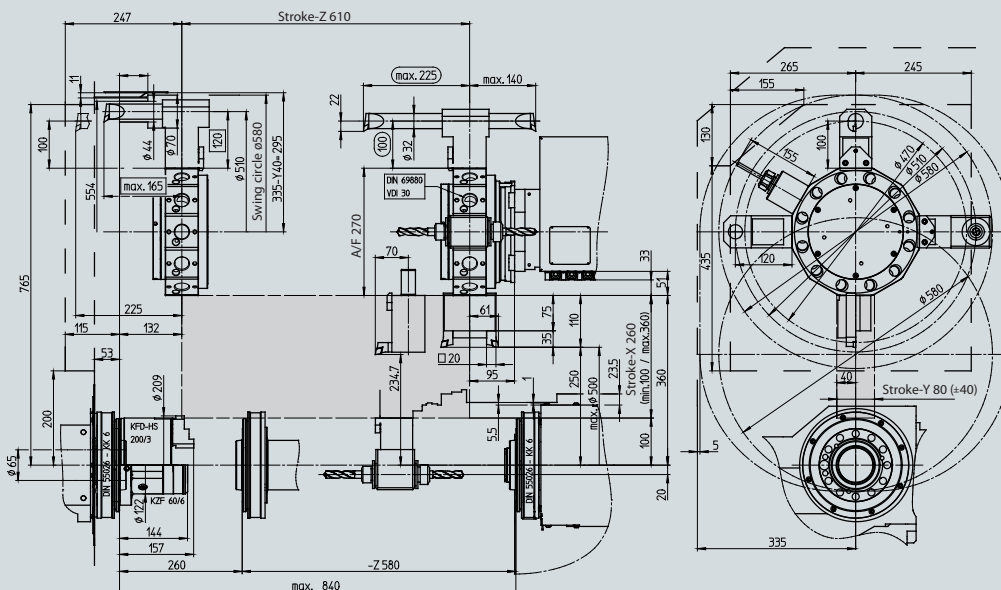


Work area E65 with tailstock - VDI30

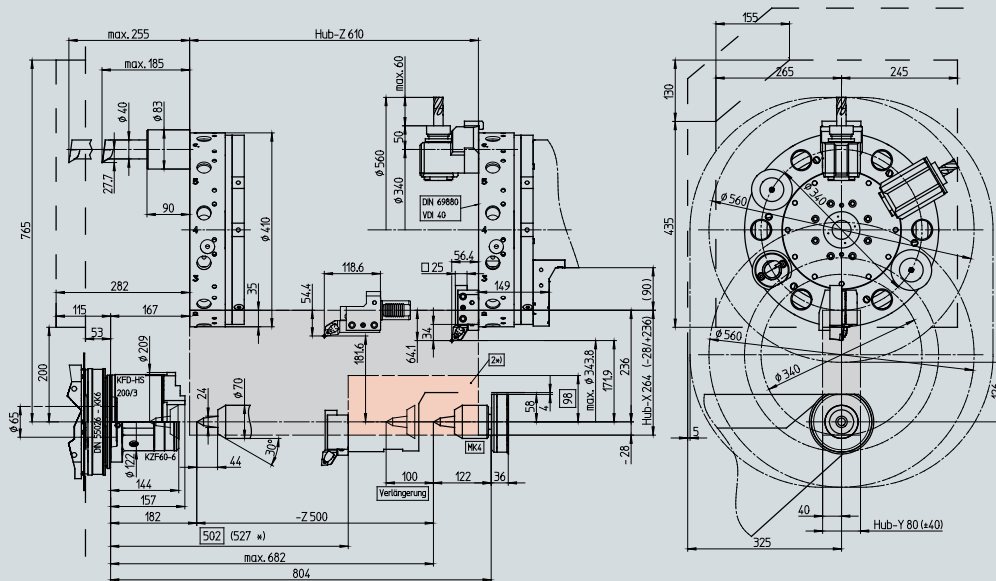


- *) Machine without Y-axes
- 2*) through Software limit switches collision-protected area

Work area E65 with counter spindle - VDI30

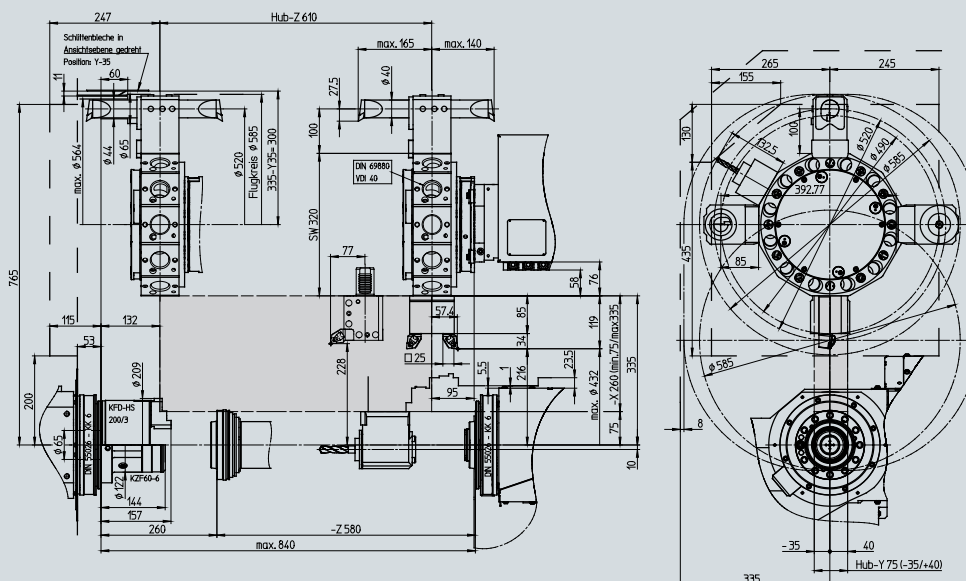


Work area E65 with tailstock - VDI40

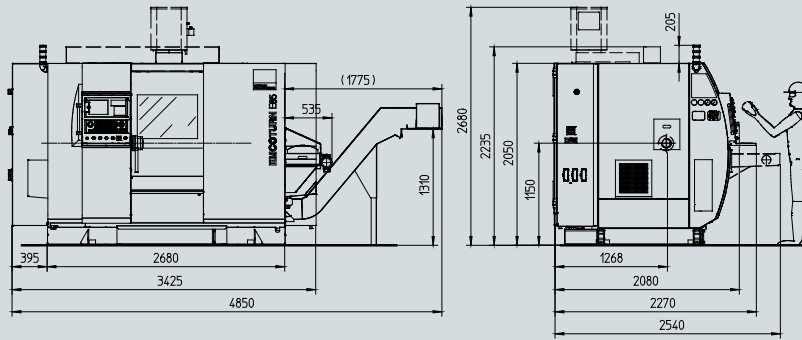


- *) Machine without Y-axes
- 2*) through Software limit switches collision-protected area

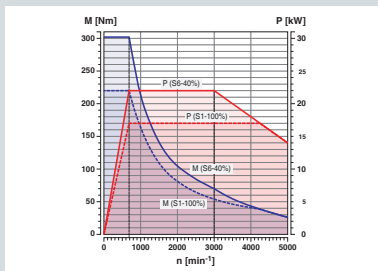
Work area E65 with counter spindle - VDI40



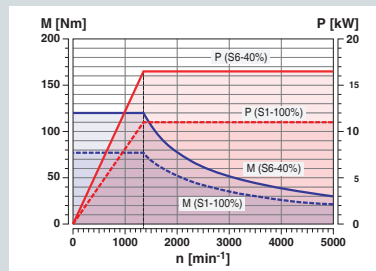
Machine layout E65



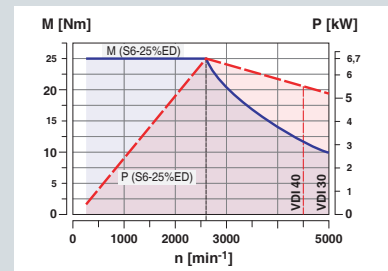
Performance diagram



Motor characteristics for main spindle



Motor characteristics for counter spindle



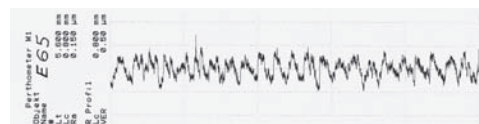
Tool turret motor characteristics for driven tools

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 55 mm |
| Cutting speed: | 300 m/min |
| Feed rate: | 0,025 mm/U |
| Cutting depth: | 0,03 mm |

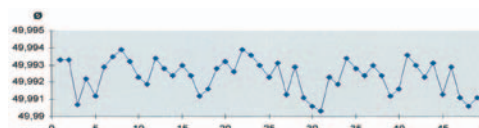
| | |
|-----------------|--------------|
| As measured: | |
| Roundness: | 0,45 μm |
| Surface finish: | Ra = 0,15 μm |



REPEAT ACCURACY

| | |
|-------------------|--------------------|
| Material: | Steel – 16 Mn Cr 5 |
| Turning diameter: | ø 50 h6 |
| Tolerance: | 16 μm |
| Spindle speed: | 2000 rpm |
| Feed rate: | 0.08 mm/rev |
| Cutting depth: | 0.2 mm |

| | |
|--------------|------|
| As measured: | |
| Range: | 4 μm |
| Cm value: | 2,70 |



Long term machining accuracy: 4 μm

EMCOTURN E65

Technical Data

Work area

| | |
|---|-------------------------|
| Swing over bed | 610 mm (24") |
| Swing over slide | 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 | 500 mm (19.7") |
| Maximum part length | 520 mm (20.5") |
| Maximum bar diameter | 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-axes

| | |
|-----------------------|----------|
| 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 | MT 4 |

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 indexing time | 0.7 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 | 3,5 / 3,5 / 4 μm (0.00014 / 0.00014 / 0.00016") |

Coolant system

| | |
|-----------------------|-----------------------------------|
| Tank volume | 230 liters (50 gal) |
| Pump power (optional) | 0.57 (2.2) kW (0.76 (2.95) 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 Compact Load

| | |
|-------------------------|-----------------------------|
| Bar length | 150 – 1100 mm (5.9 – 43.3") |
| Bar diameter | Ø 8 – 65 mm (0.31 – 2.55") |
| Material storage | approx. 550 mm (21.7") |
| Length | 1700 mm (66.9") |
| Width | 1100 mm (43.3") |
| Height (spindle center) | 1097 mm (43.2") |
| Weight | approx. 500 kg (1102.3 lb) |

Safety devices

CE compliant

