

**[ E[M]CONOMY ]**  
means:

**emco** group

Designed for your profit



## Expanding the playing field. **HYPERTURN 65 Powermill**

High-performance turning/milling center for complete machining of complex workpieces in one operation

# HYPERTURN 65 Powermill

## [Upper tool system]

- Powerful milling spindle 29 kW
- Wide speed range 0-12000 rpm
- Water-cooled motor spindle with HSK-T63
- Internal and external coolant supply
- B axis with zero backlash direct drive
- B axis position can be fixed in any position

## [Upper Y axis]

- Large working stroke +120 / -100
- Short cantilever length
- Pre-loaded roller guides
- Wide guide clearance

## [Main spindle]

- Integrated spindle motor (ISM) in synchronous technology - water-cooled
- High drive power 29 (37) kW
- High torque 250 (360) Nm
- Large speed range  
0 - 5000 (4000/3500) rpm
- Highly dynamic
- Bar capacity diameter 65 (76/95) mm

## [Tool magazine]

- 20-slot disc-type tool magazine
- 40/80/120-slot chain-type tool magazine
- Ergonomically arranged up front
- Easy to be manually loaded with tooling
- Max. tool length 250 mm
- Max. tool diameter 80 (120) mm
- Max. tool weight 5 kg

## [Lower tool system]

- 12-station tool turret
- VDI30- (VDI40- or BMT55P-) quick-change system
- 12 driven tool stations
- Servo-controlled
- Rigid tapping
- Polygonal turning, etc.

## [Lower Y axis]

- Travel +/- 50 mm
- Stable, compact construction
- Wide guide clearances
- Tapered carriage system



Machine with optional equipment

More clearance, more power, more possibilities: with a spindle distance of 1300 mm, a powerful counter spindle which also allows 4-axis machining, a B-axis with a direct drive for complex 5-axis simultaneous milling operations, an additional Y-axis for the lower turret, and all proven, high-quality features of the Hyperturn series, the Hyperturn 65 Powermill is a powerful addition to every machine range.

# [Workpieces]

## [Counter spindle]

- Integrated spindle motor (ISM) in synchronous technology - water-cooled
- High drive power 29 kW
- High torque 250 Nm
- Wide speed range 0-5000 rpm
- Coolant feed internal for flushing
- Automatic part ejector

## [Chip conveyer]

- Hinged type conveyor belt
- Throw-off height 1200 mm
- Integrated coolant tank 400 l
- Turret pumps: 2 x 14 bar
- Flushing pumps: 2 x 3,7 bar

## [Control unit]

- Ergonomically designed
- 90° pivot and slidable
- Siemens Sinumerik 840D sl
- LCD color monitor 15"

## [Work area]

- Generous design
- Straight chip fall
- Optimum access to the work area

## [Finished part conveyer]

- Max. work piece size  $\varnothing 95 \times 200$  mm
- Max. finished part weight 4,5 kg
- Storage area 230 x 1000 mm



Sprocket-wheel  
(Steel Ck 45)



Bonnet flange  
(Brass)



Sensor housing  
(Stainless steel)



Knee  
(Steel 16 Mn Cr5)

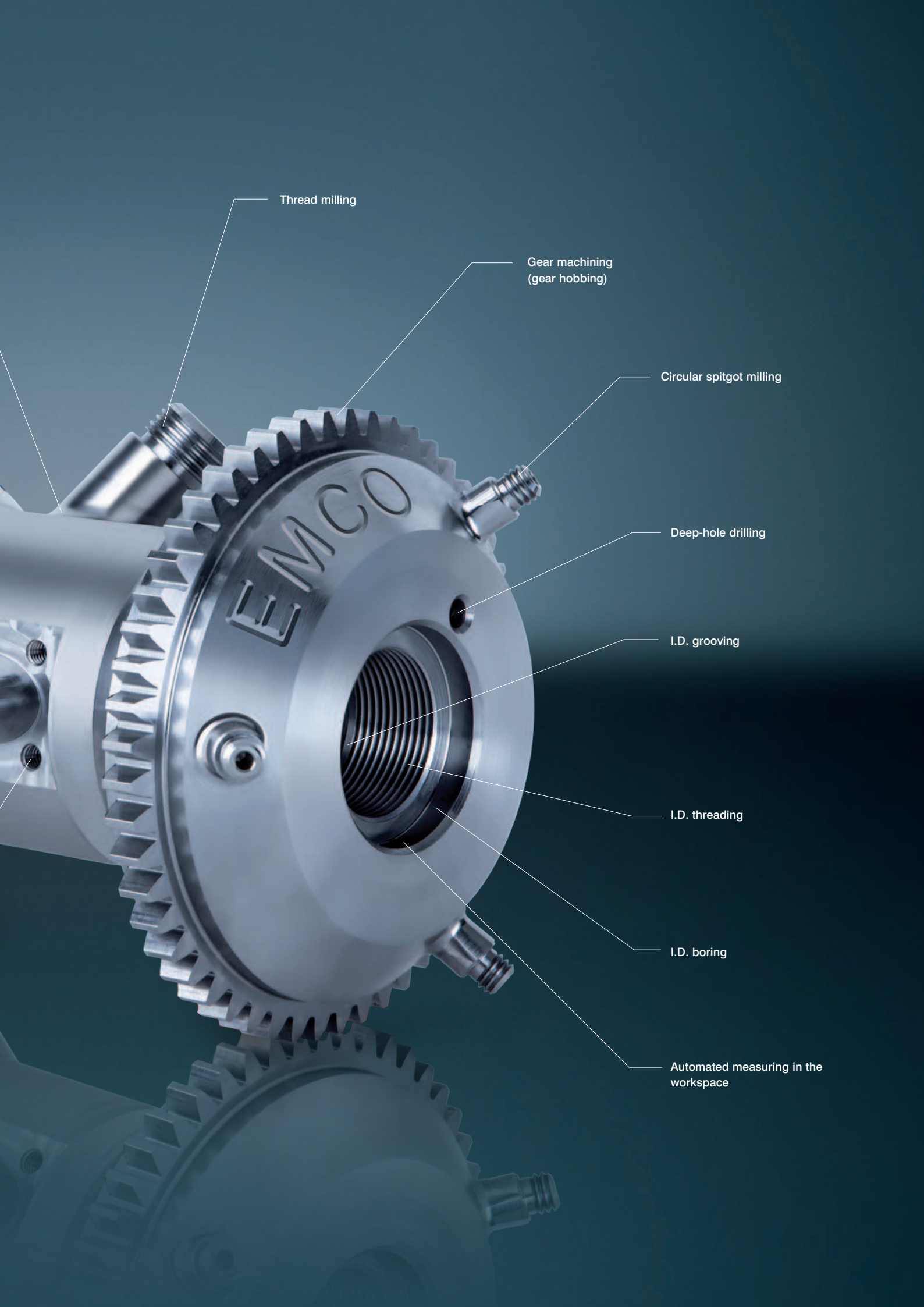


# [Hyper-Flexibility]



Machine flexibility is often sacrificed for the sake of productivity. Not with the HYPERTURN: with its high-performance and exceptionally mobile milling spindle and an almost inexhaustible tool magazine, the HYPERTURN can do nearly anything - and very quickly.





Thread milling

Gear machining  
(gear hobbing)

Circular spitgot milling

Deep-hole drilling

I.D. grooving

I.D. threading

I.D. boring

Automated measuring in the  
workspace

# [Engineering]

## Highlights

- High dynamics due to state-of-the-art spindle motor technology
- All spindles liquid-cooled for optimum thermostability
- High productivity due to short tool change times
- Both tool systems can be used on both spindles
- Bed design for maximum stability and oscillation damping
- Excellent repeatability due to linear guides
- Short set-up times due to ease of access to work area



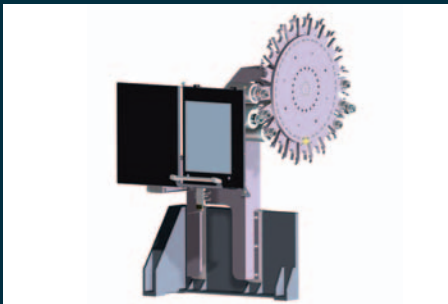
**Main spindle.** With an output of 29 (37) kW and 250 (360) Nm torque, the main spindle is powerful enough to machine from bar-stock up to a diameter of 65 (76/95) mm and chuck parts up to a diameter of 250 mm. A mechanical clamp brake ensures additional stability for high-performance milling.



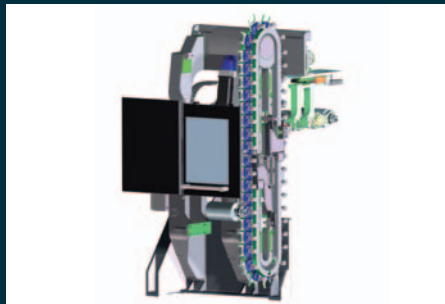
**Milling spindle.** At 29 kW/79 Nm and a max. speed of 12,000 rpm, the HYPERTURN 65 PowerMill supports state-of-the-art milling processes such as HSC or HPC. This means that complex turned and milled parts can be produced in an extremely efficient manner.



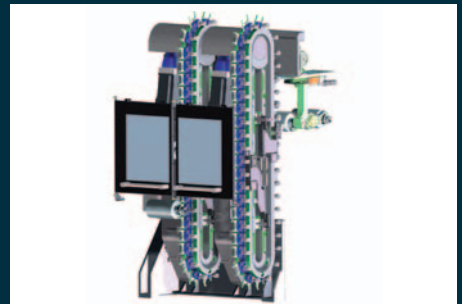
**Counter spindle.** The moving counter spindle offers identical performance data to the main spindle. The mechanical disc brake is also included in the basic equipment level. Additionally, a stroke-monitored part ejector that is flooded with coolant is integrated into the spindle. This ensures a reliable, unmanned machining process.



**20-slot magazine.** The tools are stored in a 20-slot tool disc. The milling spindle simply puts the last tool into an empty position, indexes to the next tool and picks it up.



**40-slot magazine.** The chain magazine can hold up to 40 tool holders with HSK-A63 and HSK-T63 shafts. A pivot-arm changer changes the tool into the milling spindle.



**80-slot magazine.** Two 40-slot chain magazines can be used for up to 80 tool holders HSK-A63 and HSK-T63 shafts. Due to the large stock of tools, the tooling times are reduced to a minimum. The tool cabinet is built into the machine, so to speak.



**Control unit.** The Sinumerik 840D sl control unit is located on the right of the workspace on the HYPERTURN 65 PowerMill in a sliding panel and can be swivelled in. This ensures maximum ergonomics for the set-up and running-in the machine.

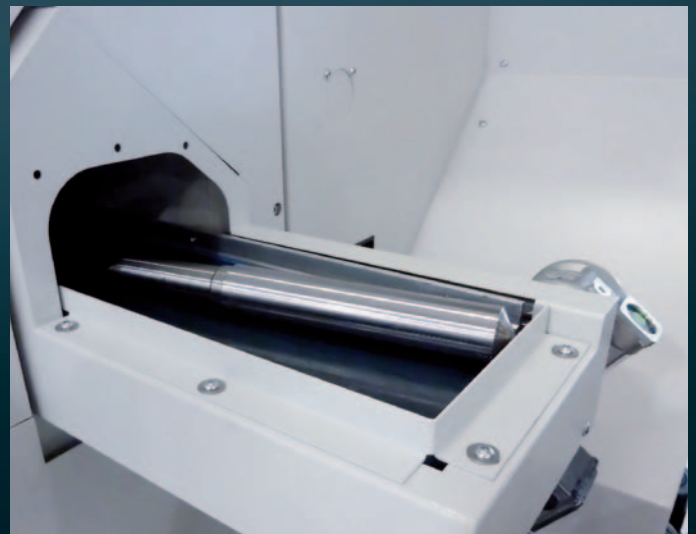
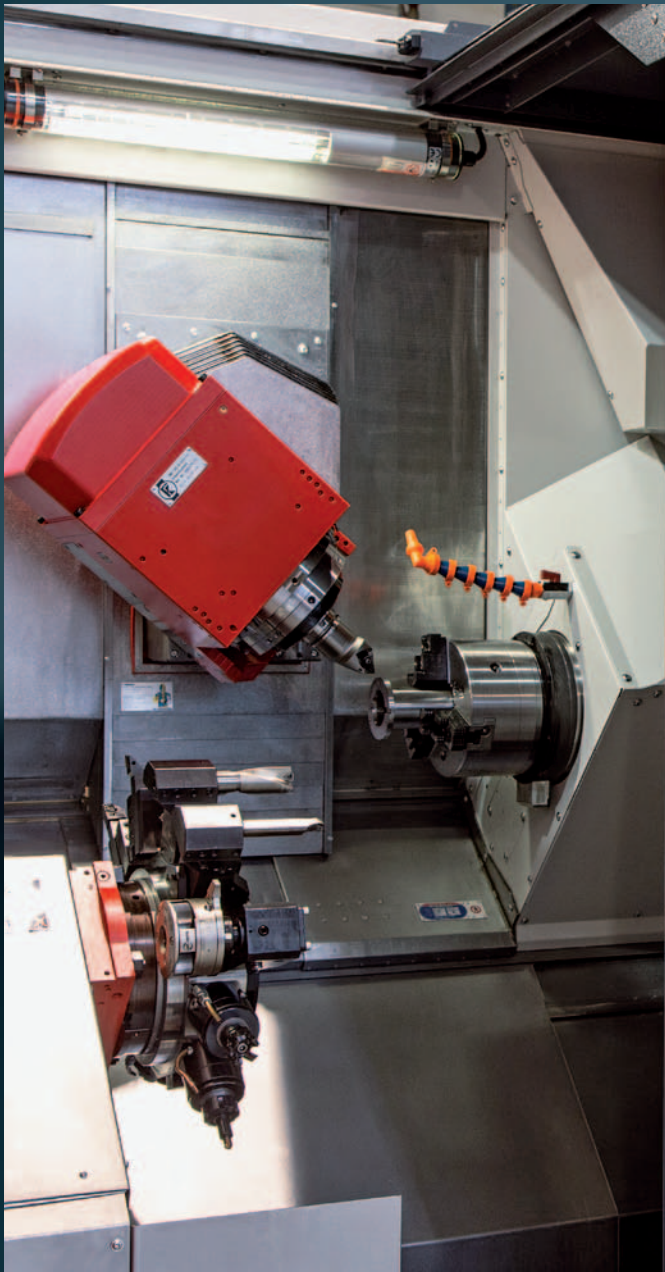


**Manual tool changing.** Tools can be loaded into the two chain magazines from the front. This avoids the need for the user to go to the rear of the machine. Also tool wear or break inspections can be handled in a time-saving way.



**Tool measuring.** The tool measuring arm in the workspace enables fast and precise measuring of tools in the workspace. It is mounted manually in the bracket below the main spindle and returned to a storage tray after use.



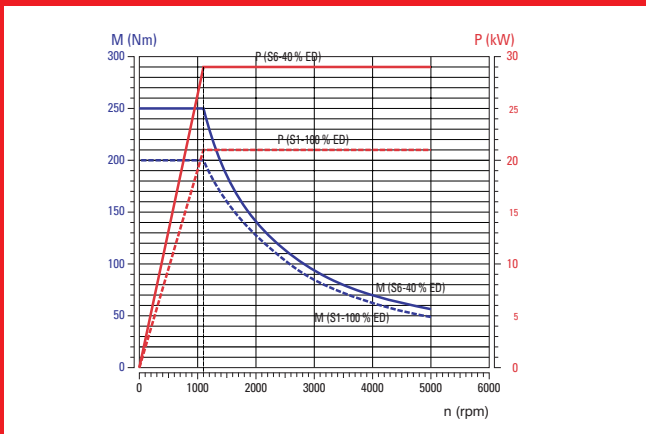


**Parts catcher.** The HYPERTURN 65's electro-pneumatic parts catcher is controlled using M functions. When needed, it traverses to the front of the work area and pivots to the spindle center. The finished part is removed from the clamping device and transferred to the catcher tray. The parts catcher then moves back to its initial position and the part is tipped onto a conveyor belt.

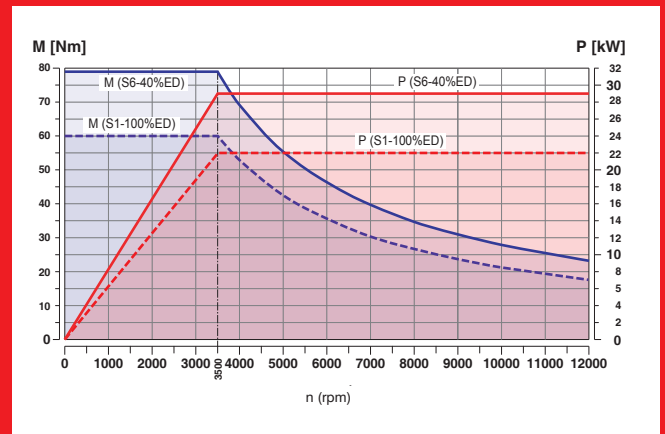
**Finished part conveyor belt.** On the conveyor belt within the machine casing, arranged lengthwise, with a storage surface of 1400 x 180 mm, the work pieces are put down damage free.



## Power and torque diagram

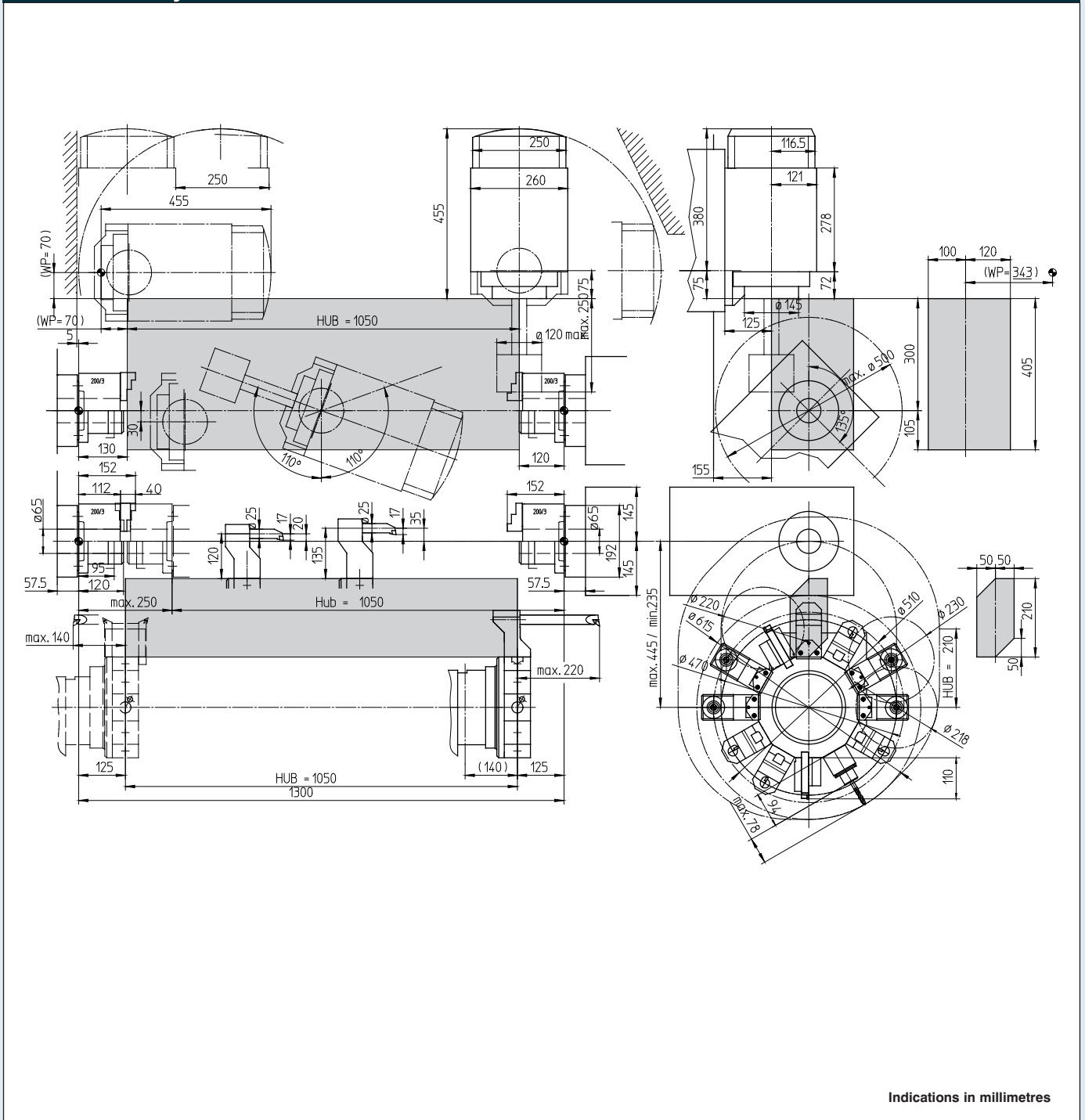


HYPERTURN 65 main spindle / counter spindle



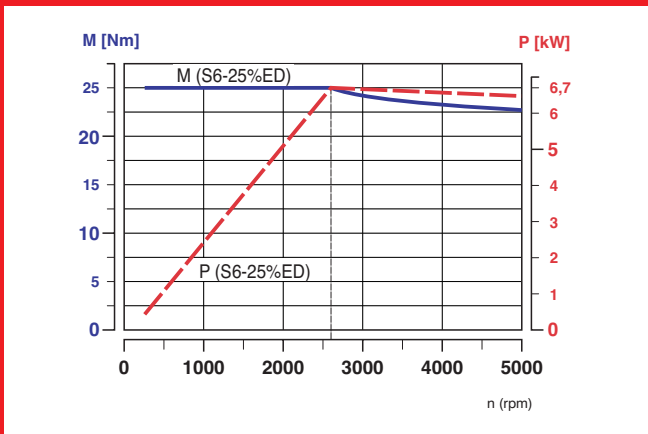
HYPERTURN 65 milling spindle

## Work area layout and turret clearance HYPERTURN 65

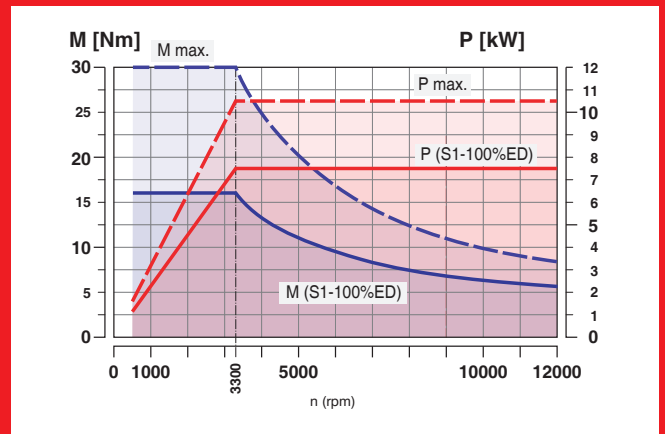


Indications in millimetres

## Power and torque diagram

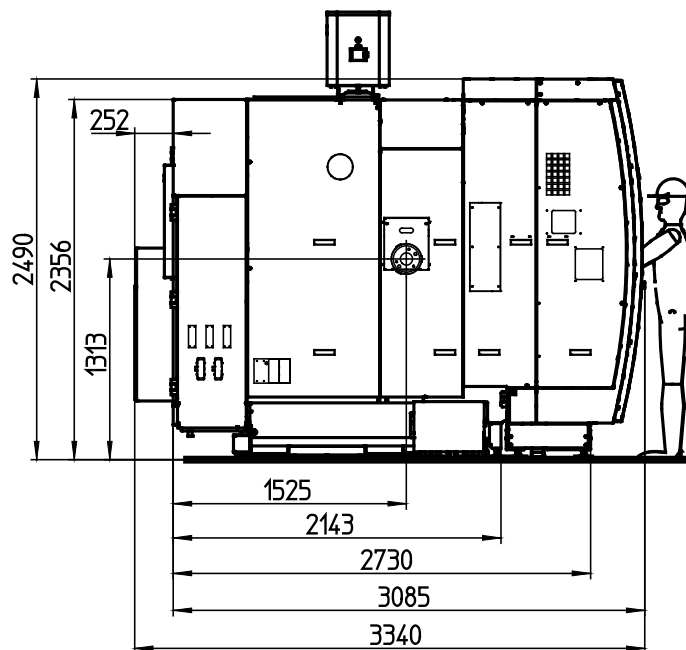
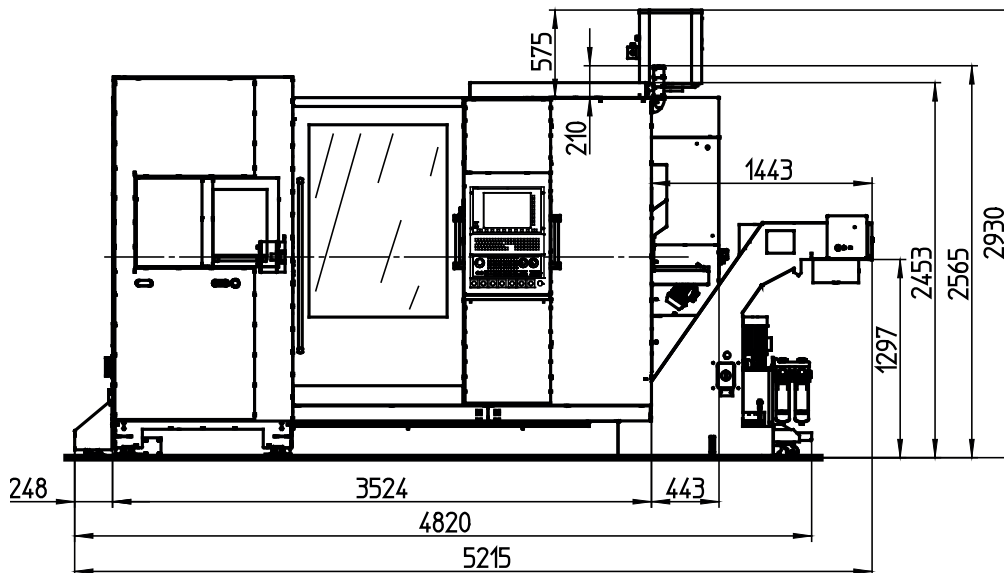


Milling drives in tool turret with VDI 30/40



Direct milling drives in tool turret with BMT55P

## Machine layout HYPERTURN 65



Indications in Millimetre

# Automatic Return on Investment

Even in the design stage of the HYPERTURN, the EMCO development engineers were already aware that a highly productive industrial machine such as the EMCO HYPERTURN would need high-performance automation periphery. Which is why the HYPERTURN gantry loader was immediately included in the HYPERTURN concept and design, which produced a particularly homogeneous solution.

## 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



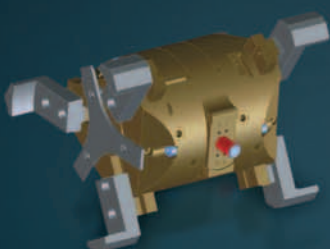
4-station pallet attachment for valve caps



20-station pallet magazine with customer-specific pallets

## Customizing options:

The HYPERTURN gantry loader is a universal loading and unloading device for all models in the HYPERTURN Series. EMCO Automation can equip it to your individual needs with numerous gripper and handling systems. How we do it: we standardize the components and customize the solution. The goal: a custom-tailored machine for the same price as a standard unit.



2x3-jaw double gripper head



4x3-jaw gripper head



Shaft gripper head





### Pivoting B axis

The special feature of the HYPERTURN gantry loader is the integrated B axis as swivel unit. It enables blanks to be loaded into devices at an angle and simultaneous pivoting and positioning. This means not only almost unlimited flexibility in loading and unloading, it also dramatically reduces cycle times.



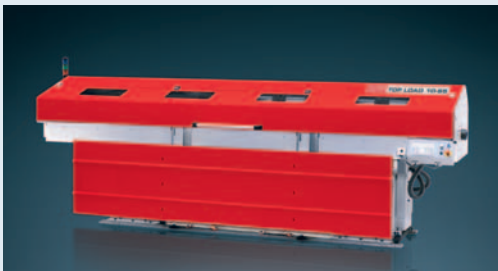
### Measuring system

An integrated measuring unit allows serial production of high precision components with minimum man-power. Tool offset changes are done fully automatically. Each workpiece is loaded into the measuring system via the gantry loader and measured using the feeler. Good parts are pushed into the storage box and bad parts are separated into a special chute.



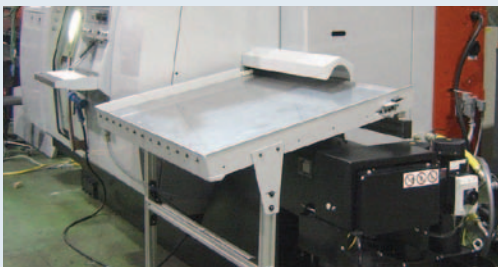
### Short and to the point

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. Custom-made for the HYPERTURN – and the perfect solution for automatic feeding and loading of cut-to-length bars.



### EMCO TOP LOAD

A bar-loader which automatically reloads 3-meter bar stock. The loader is exceptionally reliable and has a patented guidance system that allows you to switch to a different bar stock diameter in just a minute or two. If required, the loader can also be extended by adding several material storage strips and can therefore be operated automatically for even longer periods.



### Unloading through the counter spindle

Long, thin workpieces can be removed from the machine using the counter spindle. Long parts can be stored in different ways. Finished parts can simply be allowed to roll away via a sloping surface or can be gathered to the side for storage using a timed belt.



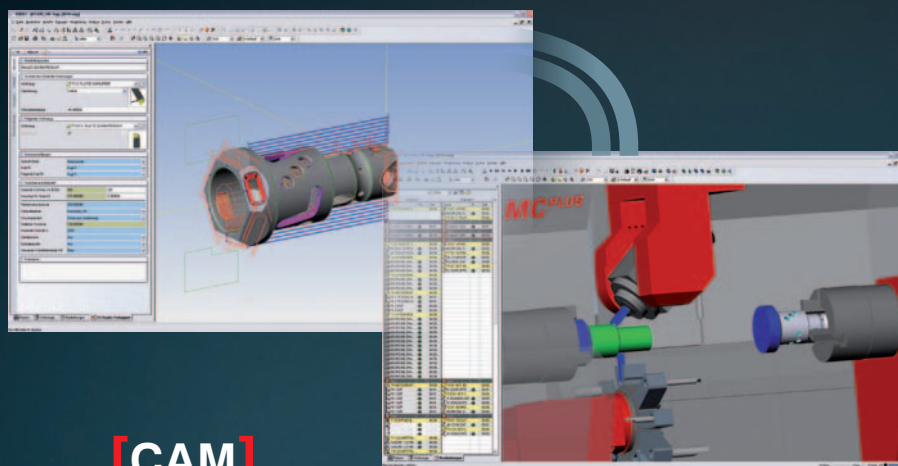
The Esprit CAM system offers high flexibility and process security, a comprehensive selection of machining cycles, maximum tool control, and cross-machine technology for your entire production facility.



## [CAD]

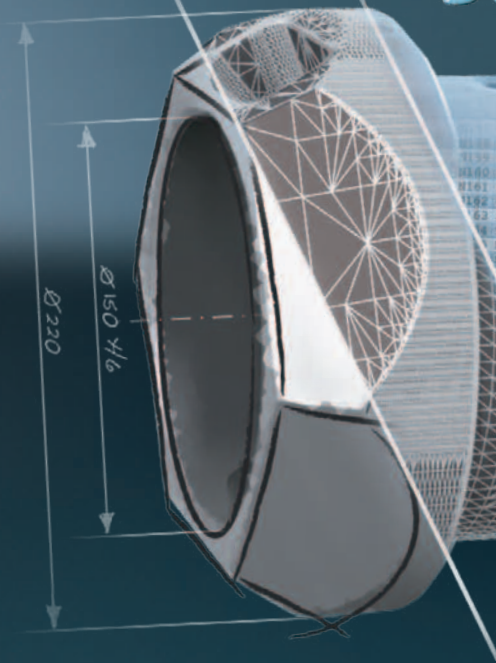
Direct CAD data import

- AutoCAD (DWG)
- Parasolid®
- Solid Edge®
- Solid Works®
- ACIS® (SAT)
- Optional interfaces: CATIA®, Pro/ENGINEER®, STEP, STL,...



## [CAM]

- 2-22 axis turning
- 2-5 axis milling
- Multi-tasking of turning and milling
- 3D machine space simulation
- Certified post-processors



## [CAD]



# emcoCPS | Pilot

## The Virtual Machine

A 1:1 mapping of the real machine for defining and testing processes, optimizing machining sequences, and training new operators.

### [Process chain]



### [CPS]

- 1:1 simulation with collision detection
- Direct connection to CAM ESPRIT
- Process optimization
- Reverse simulation of existing NC codes
- Reduction in scrap rates
- Training on the virtual machine
- Simulation of loading systems (e.g. EMCO gantry loader)

### [CAM] [CPS] [Production]



### [Production]

- Reduction in set-up costs
- Reduction in downtimes
- Reduction in repair costs

**OPTIMUM MACHINE UTILIZATION**



# Quality components



## [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.



[www.emco-magdeburg.de](http://www.emco-magdeburg.de)

## [Headstocks]

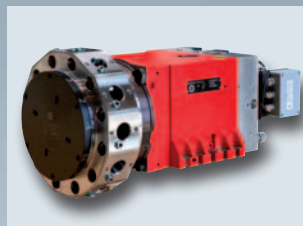
The design and manufacture of headstocks are two of EMCO's core competencies. During engineering, the focus is on precision, robustness, high rigidity, precise rotational characteristics, and a long service life.



[www.emco-magdeburg.de](http://www.emco-magdeburg.de)

## [Tool turret]

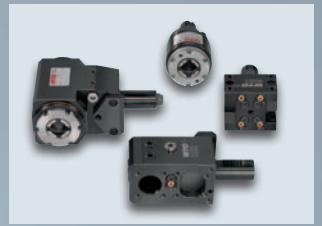
Rapid-indexing turrets with adjustable swivel speeds and milling drives represent the current state of the art. The backlash-free milling drive is not only ideal for milling and drilling, but also for rigid tapping, hobbing, and polygonal turning.



[www.sauter-feinmechanik.com](http://www.sauter-feinmechanik.com)

## [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.



[www.wto.de](http://www.wto.de)

## [Clamping cylinder / chuck]

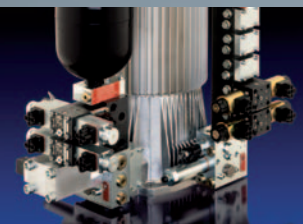
Hydraulically activated clamping cylinders and chucks guarantee the precise, safe clamping of work pieces. Programmable sensors are used for stroke monitoring. There is no need for time-consuming adjustments of contactless limit switches.



[www.roehm.biz](http://www.roehm.biz)

## [Hydraulic systems]

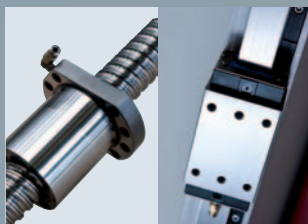
Compact dimensions, quiet operation, and high energy efficiency - just some of the advantages of the hydraulic assemblies used by EMCO. Monitored pressure switches prevent the need for time-consuming manual pressure adjustments.



[www.hawe.de](http://www.hawe.de)

## [Ball screws and roller guides]

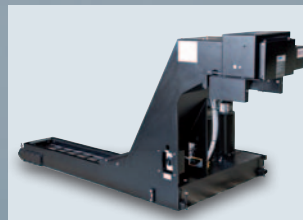
Highly precise and generously dimensioned guide rails and ball screws with optimal pretensioning form the basis for the machining of precision parts.



[www.boschrexroth.com](http://www.boschrexroth.com)

## [Chip conveyor]

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



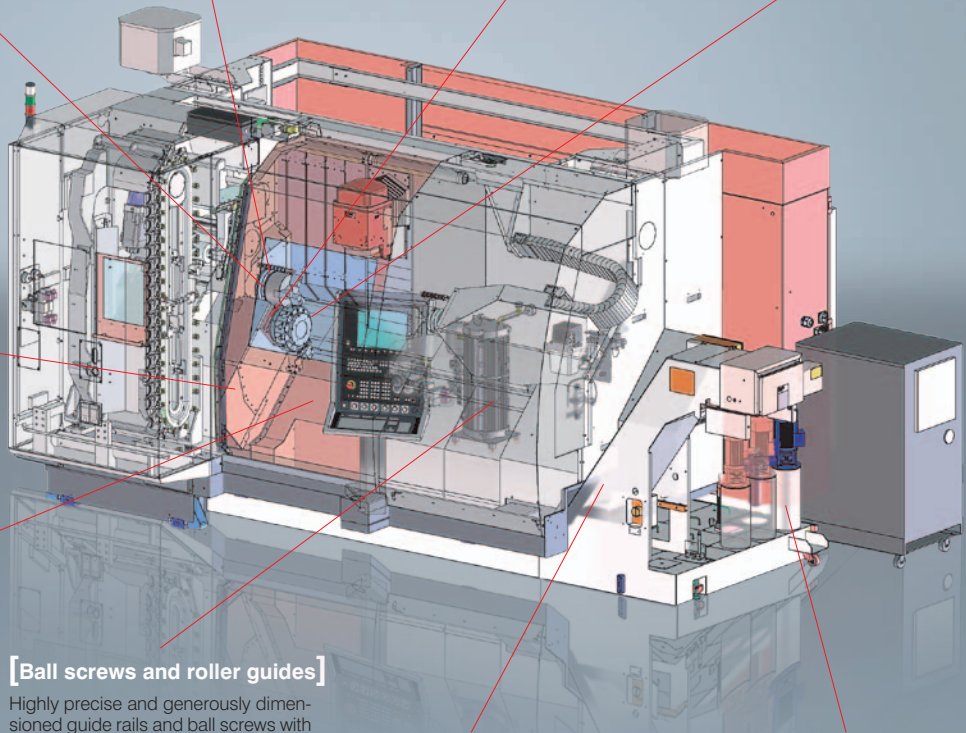
[www.knollmb.de](http://www.knollmb.de)

## [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.



[www.grundfos.at](http://www.grundfos.at)





# 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.

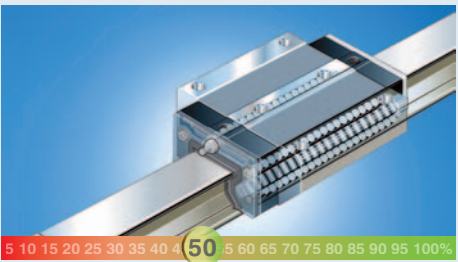
**[Regenerative drive system]**  
Kinetic energy is converted into electrical energy and fed back into the grid.  
**Savings of up to 10%**



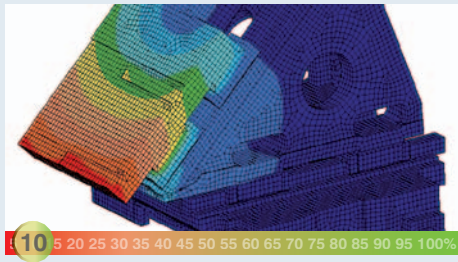
**[Compact hydraulics unit with pressure accumulator]**  
Thanks to its accumulator charging system, the pump only runs when required. If the pressure accumulator is full, the pump switches over to closed loop circulation.  
**Savings of up to 90%**



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



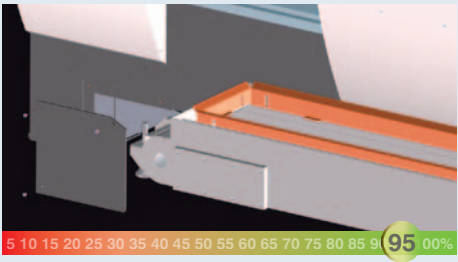
**[Structurally optimized mechanics]**  
FEM analysis is used to optimize the relevant components in terms of their rigidity while simultaneously reducing their weight.  
**Savings of up to 10%**



**[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%**



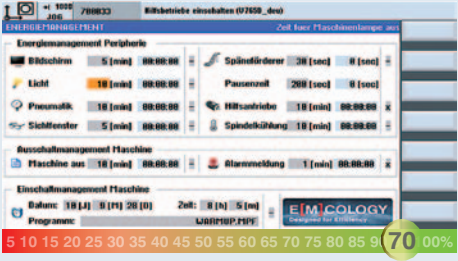
**[Intelligent standby concepts]**  
Reduced consumption by automatically switching off ancillary units and machine space/screen illumination after a defined period of inactivity on the control panel.  
**Savings of up to 50%**



**[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%**



# [Technical data]

**emco** group

Designed for your profit

## HYPERTURN 65 Powermill

Work area	
Swing over bed	500 mm
Distance between spindle noses	1300 mm
Maximum turning diameter	500 mm
Max. part length	1040 mm
Max. bar-stock diameter	65 (76/95) mm
Travel	
Traverse path X1 / X2	405 / 210 mm
Traverse path Z1 / Z2	1050 / 1050 mm
Traverse path Y1 / Y2	220 / 100 mm
Traverse path counter spindle Z3	1050 mm
Main spindle	
Speed range (infinitely variable)	0 – 5000 (3500/4000) rpm
Maximum torque	250 (360) Nm
Spindle nose DIN 55026	A2-6 (A2-8)
Spindle bearing (inside diameter)	105 (130/140) mm
Spindle bore (excluding draw-back rod)	Ø 73 (86/106) mm
Counter spindle	
Speed range (infinitely variable)	0 – 5000 rpm
Maximum torque	250 Nm
Spindle nose DIN 55026	A2-6
Spindle bearing (inside diameter)	Ø 105 mm
C-axes	
Resolution	0,001°
Rapid traverse	1000 rpm
Drive power	
Main spindle (AC integrated-spindle motor)	29 (37) kW
Counter spindle (AC integrated-spindle motor)	29 kW
Milling spindle - Powermill	
Speed range	0 – 12000 rpm
Maximum torque	79 Nm
Maximum Drive power	29 kW
Type of tool shank	HSK-T63
B-axis	
Travel range	220°
Holding torque of clamp	4000 Nm
Interpolating drive torque	332 Nm
Tool magazine	
Tool storage capacity	20 / 40 / 80 mm
Max. tool diameter	Ø 80 (Ø 120) mm
Max. tool length	250 mm
Max. tool weight	5 kg

Tool turret	
Number of tool stations	12
VDI shaft (DIN 69880)	30 (40) mm
Tool cross-section for square-shank tools	20 x 20 (25 x 25) mm
Shank diameter for boring bars	32 (40) mm
Tool indexing time	0,7 sec.
Driven tools	
Speed range	0 – 5000 (4500) rpm
Torque	25 Nm
Drive power	6,7 kW
Tool turret with BMT-interface and direct drive	
Number of tool positions	12
Precision interface	BMT-55P
Tool cross-section for square-shank tools	20 x 20 (25 x 25) mm
Shank diameter for boring bars	40 mm
Tool indexing time	0,5 sec
Speed range of driven tools	0 – 12000 rpm
Torque of driven tools	30 Nm
Drive power of driven tools	10 kW
Feed drives	
Rapid speed X1 / X2	30 m/min
Rapid speed Z1 / Z2 / Z3	30 m/min
Rapid speed Y1 / Y2	12 m/min
Feed force X1 / X2	5000 N
Feed force Z1 / Z2	8000 N
Feed force Y1 / Y2	7000 N
Coolant system	
Tank capacity	450 l
Pump capacity	2 x 3,7 kW
Power consumption	
Connected load	50 kVA
Compressed air	6 bar
Dimensions	
Height of center above floor	1316 mm
Overall height	2490 mm
Required space L x D (without chip conveyor)	5300 x 3450 mm
Total weight	12250 kg
Safety devices	
	CE compliant



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[www.emco-world.com](http://www.emco-world.com)