

SHW
Werkzeugmaschinen
Licence to Mill



Passion for Mechanical Engineering

Originally an essential requirement for the production in the royal smelting plant, it became our passion .

In 1927 the machining department emerged from the mechanical workshop; it developed into an important element of the enterprise until the privatization in 1999.

This long tradition combined with innovation and the passion for mechanical engineering were our motivators to become specialists for the production of machines for large part processing.

SHW machines are used worldwide for all types of metal cutting applications, in building and agriculture machine technology, for motor block machining, energy industry, shipbuilding, mechanical engineering, aviation industry and many others.

Common for all our machines, independent of their model or configuration, is our passion to achieve highest precision, resulting from our long-time experience and Know-How.



Contents:

Machining Centers

UniSpeed 2000 // UniSpeed 3000 // UniSpeed 6000

Travelling Column Machines

PowerSpeed 2000 // PowerSpeed 4000
UniForce 4000 // UniForce 7000

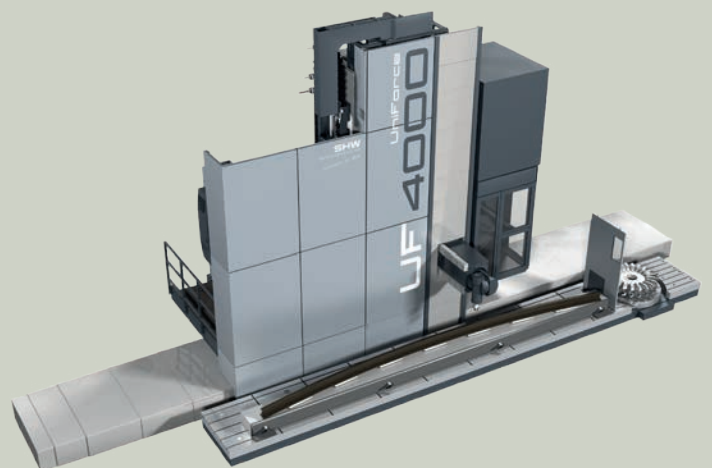
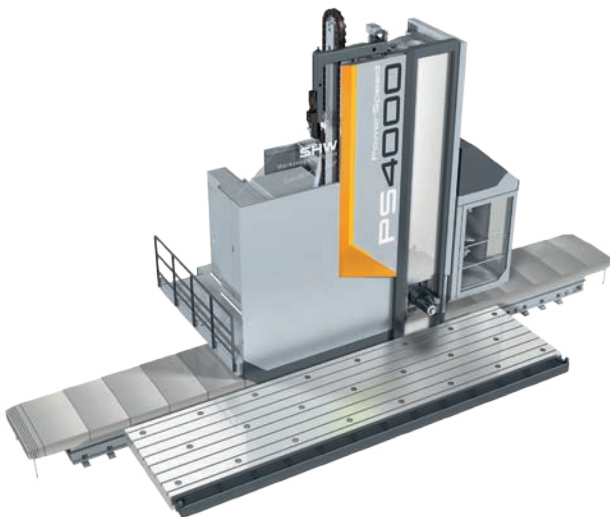
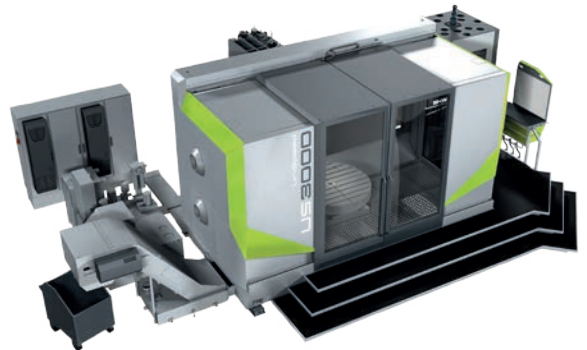
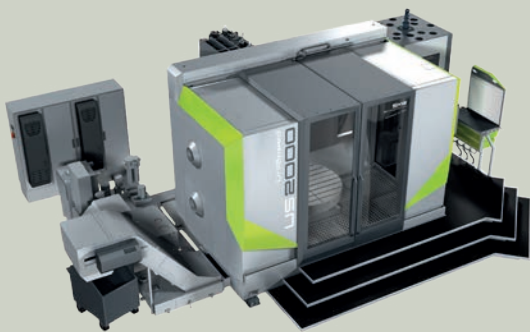
Gantry Machines

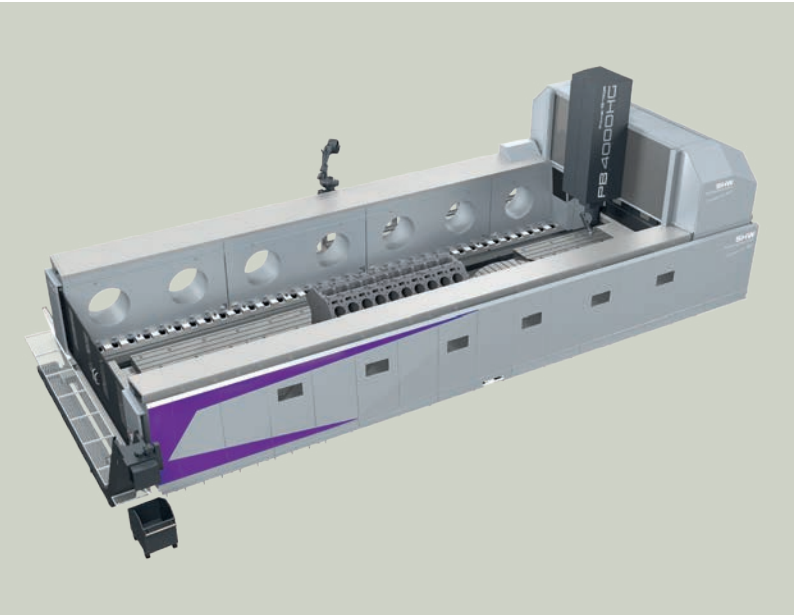
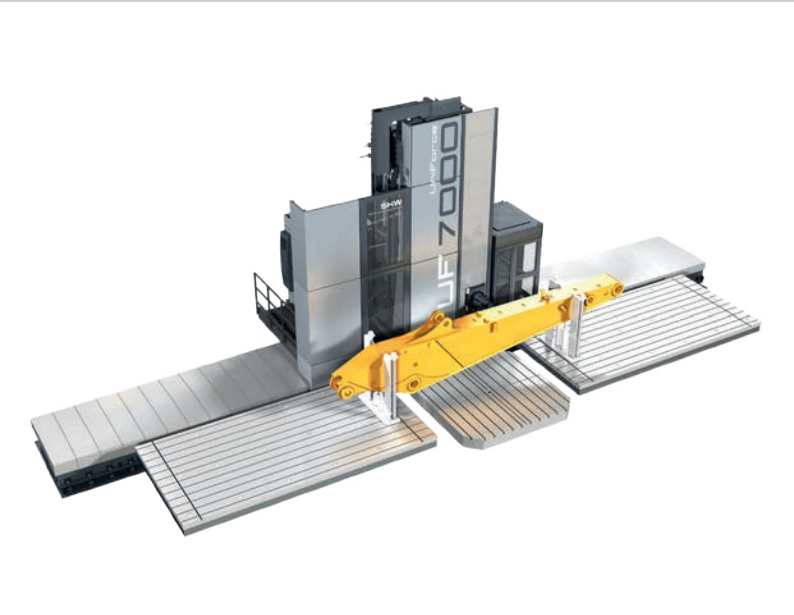
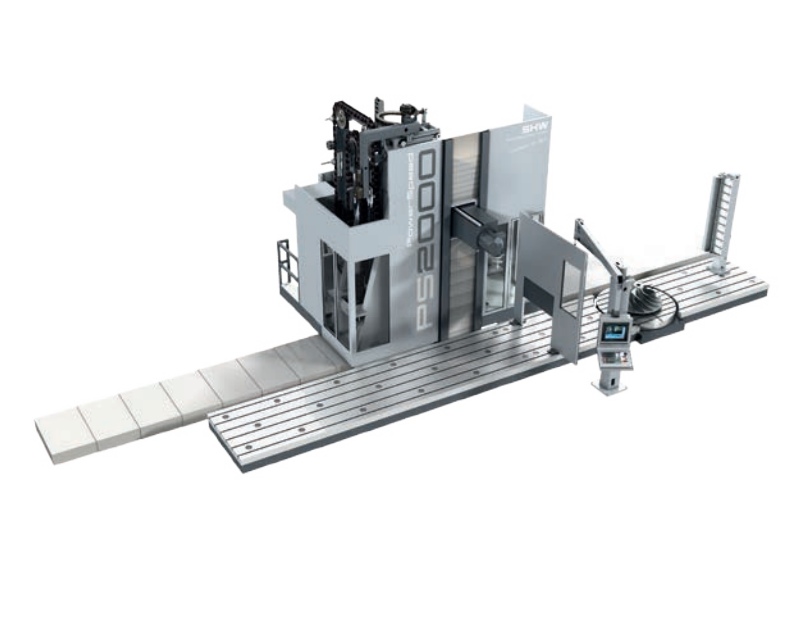
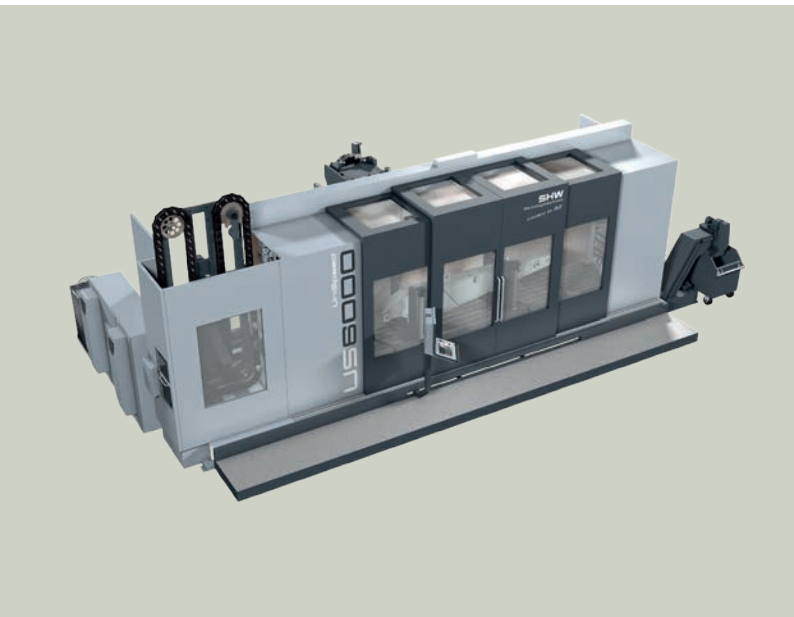
PowerBridge 5000 LG // PowerBridge 5000 HG

Milling Heads

Universal Milling Heads // Fork Milling Heads // Special Milling Heads

Technology





SHW Werkzeugmaschinen
Production Program

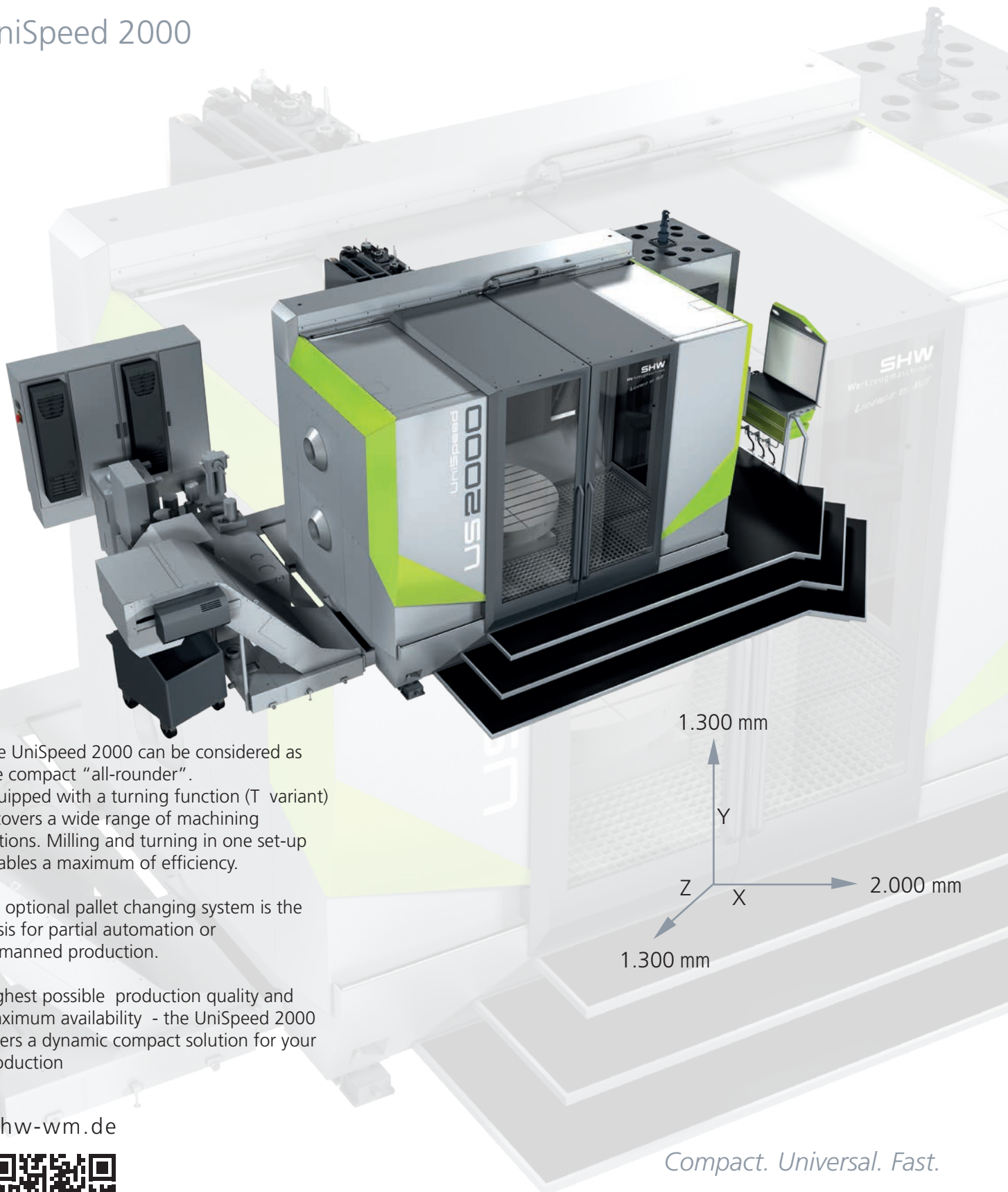


Machining Centers

UniSpeed 2000 // UniSpeed 3000 // UniSpeed 6000



UniSpeed 2000





Technical Data

Working areas / Travels			Clamping surfaces		
X axis (horizontal longitudinal)	mm	2.000	Clamping table	mm	2.000 X 1.600
Y axis (vertical)	mm	1.300	Rotary/turning table	mm	Ø 1.600 / 1.800 / 2.000
Z axis (horizontal cross)	mm	1.300			
Orthogonal milling head			Rotary table		
	degree(°)	1° indexing	Speeds	rpm	5
		(64.800 head positions)	Torque	Nm	10.000
		infinitely variable	Table load	kg	8.000
Main drive/Motor spindle			Turning table		
Drive power	kW	up to 44/70	Speeds	rpm	300
Speed range	rpm	up to 8.000/24.000	Torque	Nm	2.900
Feeds and rapid traverses			Table load	kg	8.000 (Milling)
X, Y, Z axis	mm/min	0-30.000		kg	6.000 (Turning)
Acceleration of the linear axes	m/s ²	2	ATC		
Machine weight			Number of pockets		up to 185
	kg approx.	45.000	Tool Taper		
CNC-system			optional		SK 50 BIG-PLUS HSK 100 A DIN 69893
		Siemens 840D sl Heidenhain TNC 640			

Your Benefits



Tool Changer / ToolTower

Shortest chip-to-chip times optimize your production process



Milling Head

Full power in any head position. 64.8000 machining positions, available with 1° indexing or infinitely variable



Operator Platform

Concentrated information and an ergonomic work station grant an optimum result for your machining tasks

Pallet Changer

Ideally suited for the use of a pallet changer. Partial automation and set-up parallel to production time grant efficient machining tasks

Clearance

max. component size
UniSpeed 2000 Ø 2.300 mm



Chip Management

Optimal chip transport due to steep inlet plates and the wide, centrally positioned chip conveyor

Full Enclosure

The completely closed cabin ensures low-emission machining

Without Foundation / Floor Level

The self-contained hybrid machine frame (welded steel construction, filled with special concrete) grants high inherent stability and torsional stiffness – no requirement for an additional foundation with a sufficiently stable floor plate

Equipment features

Mill
and
Turn

without
foundation

Floor
Level

Energy
Efficient

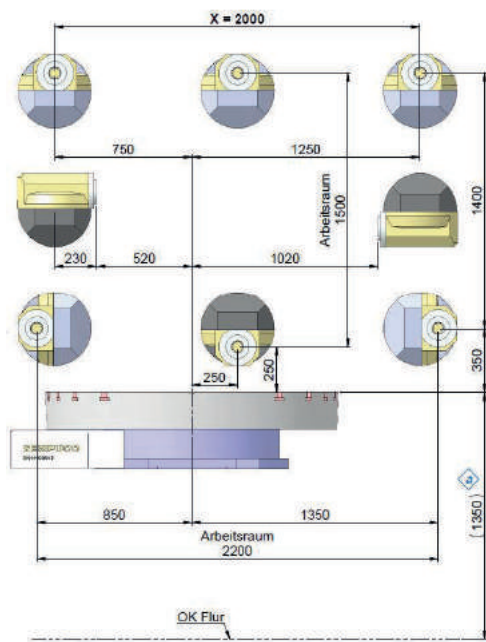
Remote
Diagnosis

Milling Head
Measure-
ment

Hybrid
Construc-
tion

Camera

Accuracies



Positional uncertainty	X-axis Y,Z-axes	P = 14 μm P = 13 μm
Positional scatter	X-axis Y,Z-axes	P _s = 10 μm P _s = 9 μm
Positional deviation	X-axis Y,Z-axes	P _a = 7 μm P _a = 5 μm
Reversal error		U = 5 μm

Milling heads

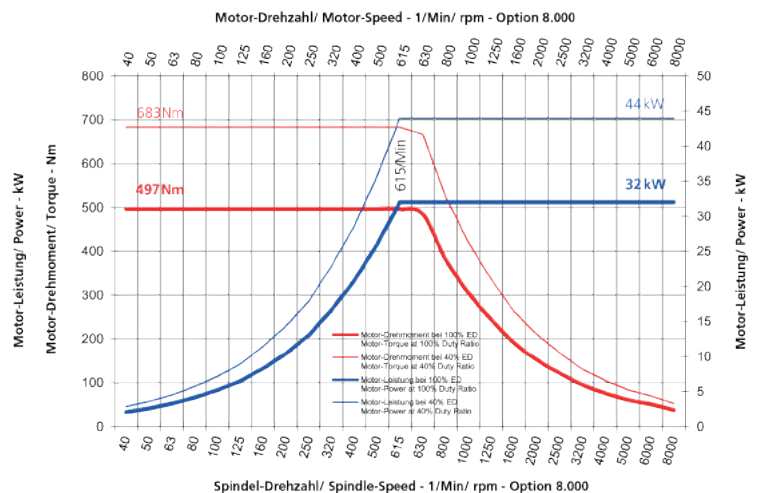
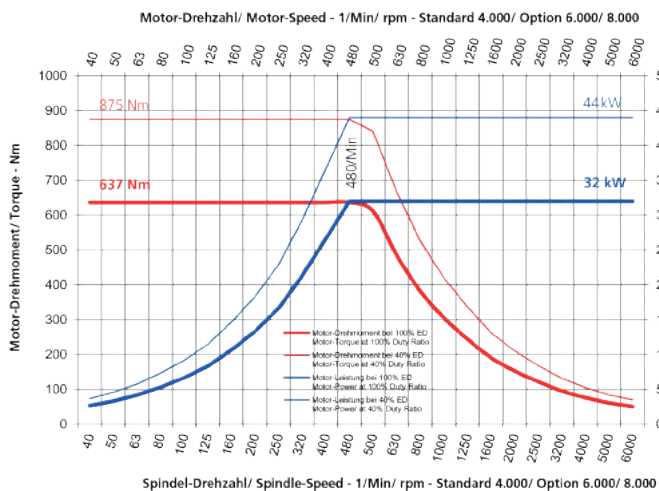


Universal milling head

Fork milling
head

Special milling heads

Performance Diagram



Options

Component handling:

- Clamping plate
- Rotary table(s)
- Turning table(s)
- Pallet changer

Tool handling:

- ATC
- ToolTower

Versions

- Milling machine
- Milling-turning machine
- Pallet changing machine

Head
compensa-
tion

clamping System

Uni
Scan

Interpolation Turning

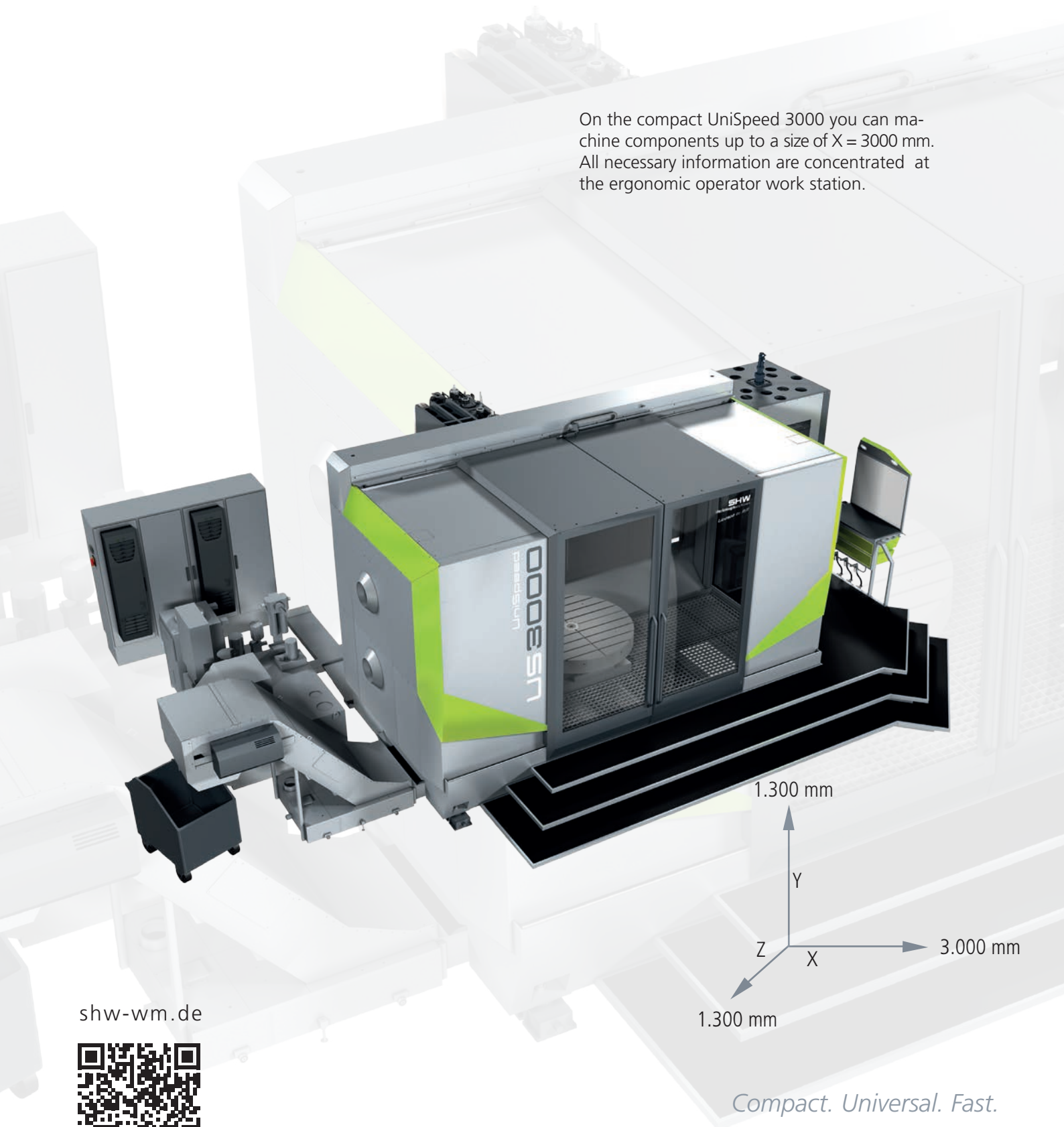
Non Circular Turning

Gear Wheel Milling

Remote Desktop

UniSpeed 3000

On the compact UniSpeed 3000 you can machine components up to a size of $X = 3000$ mm. All necessary information are concentrated at the ergonomic operator work station.





Technical Data

Working areas / Travels			Clamping surfaces		
X axis (horizontal longitudinal)	mm	3.000	Clamping table	mm	3.000X1.600
Y axis (vertical)	mm	1.300	Rotary/turning table	mm	Ø1.600/1.800/2.000
Z axis (horizontal cross)	mm	1.300			
Orthogonal milling head			Rotary table		
	degree(°)	1° indexing (64.800 head positions) infinitely variable	Speeds	rpm	5
			Torque	Nm	10.000
			Table load	kg	8.000
Main drive/Motor spindle			Turning table		
Drive power	kW	up to 44/70	Speeds	rpm	300
Speed range	rpm	up to 8.000/24.000	Torque	Nm	2.900
Feeds and rapid traverses			Table load	kg	8.000 (Milling) 6.000 (Turning)
X, Y, Z axis	mm/min	0-30.000			
Acceleration of the linear axes	m/s ²	2	ATC		
Machine weight			Number of pockets		up to 185
	kg approx.	ca. 50.000	Tool Taper		
CNC-system			Option		SK 50 BIG-PLUS HSK 100 A DIN 69893
		Siemens 840D sl Heidenhain TNC 640			

Your Benefits



Tool Changer / ToolTower

Shortest chip-to-chip times optimize your production process



Milling Head

Full power in any head position. 64.8000 machining positions, available with 1° indexing or infinitely variable



Operator Platform

Concentrated information and an ergonomic work station grant an optimum result for your machining tasks

Pallet Changer

Ideally suited for the use of a pallet changer. Partial automation and set-up parallel to production time grant efficient machining tasks

Clearance

max. component size
UniSpeed 3000 Ø 2.400 mm



Chip Management

Optimal chip transport due to steep inlet plates and the wide, centrally positioned chip conveyor

Full Enclosure

The completely closed cabin ensures low-emission machining

Without Foundation / Floor Level

The self-contained hybrid machine frame (welded steel construction, filled with special concrete) grants high inherent stability and torsional stiffness – no requirement for an additional foundation with a sufficiently stable floor plate

Equipment features

Mill
and
Turn

without
foundation

Floor
Level

Energy
Efficient

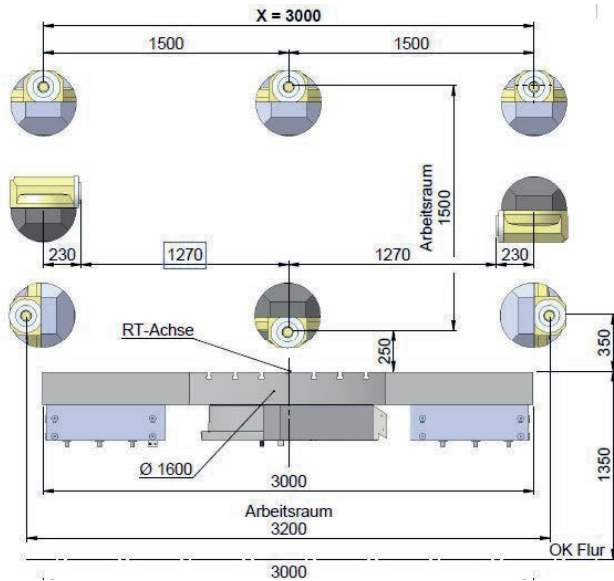
Remote
Diagnosis

Milling Head
Measure-
ment

Hybrid
Construc-
tion

Camera

Dimensions of Working Area



Accuracies

Positional uncertainty	X-axis	P = 16 μm
	Y,Z-axes	P = 13 μm
Positional scatter	X-axis	Ps = 11 μm
	Y,Z-axes	Ps = 9 μm
Positional deviation	X-axis	Pa = 8 μm
	Y,Z-axes	Pa = 5 μm
Reversal error		U = 5 μm

Milling heads

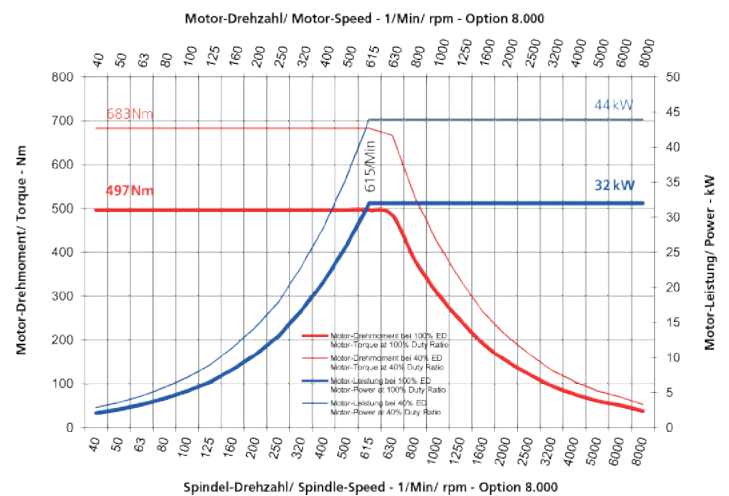
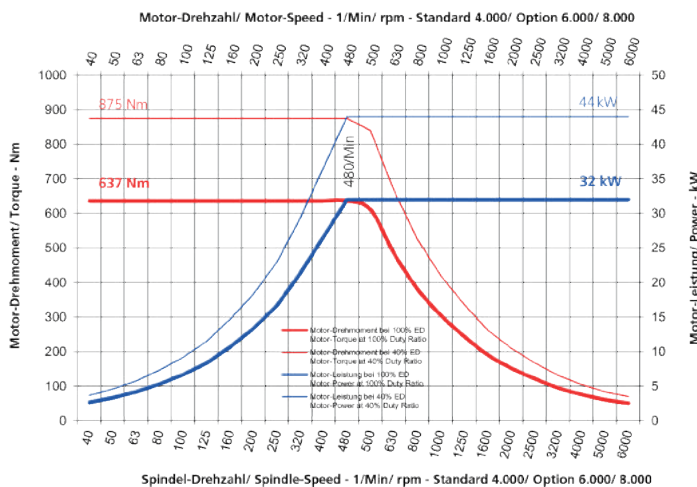


Universal milling head

Fork milling head

Special milling heads

Performance Diagram



Options

Component handling:

- Clamping plate
- Rotary table(s)
- Turning table(s)
- Pallet changer

Werkzeughandling:

- ATC
- ToolTower

Versions

- Milling machine
- Milling-turning machine
- Pallet changing machine

Head
compensation

clamping
System

Uni
Scan

Interpolation
Turning

Non
Circular
Turning

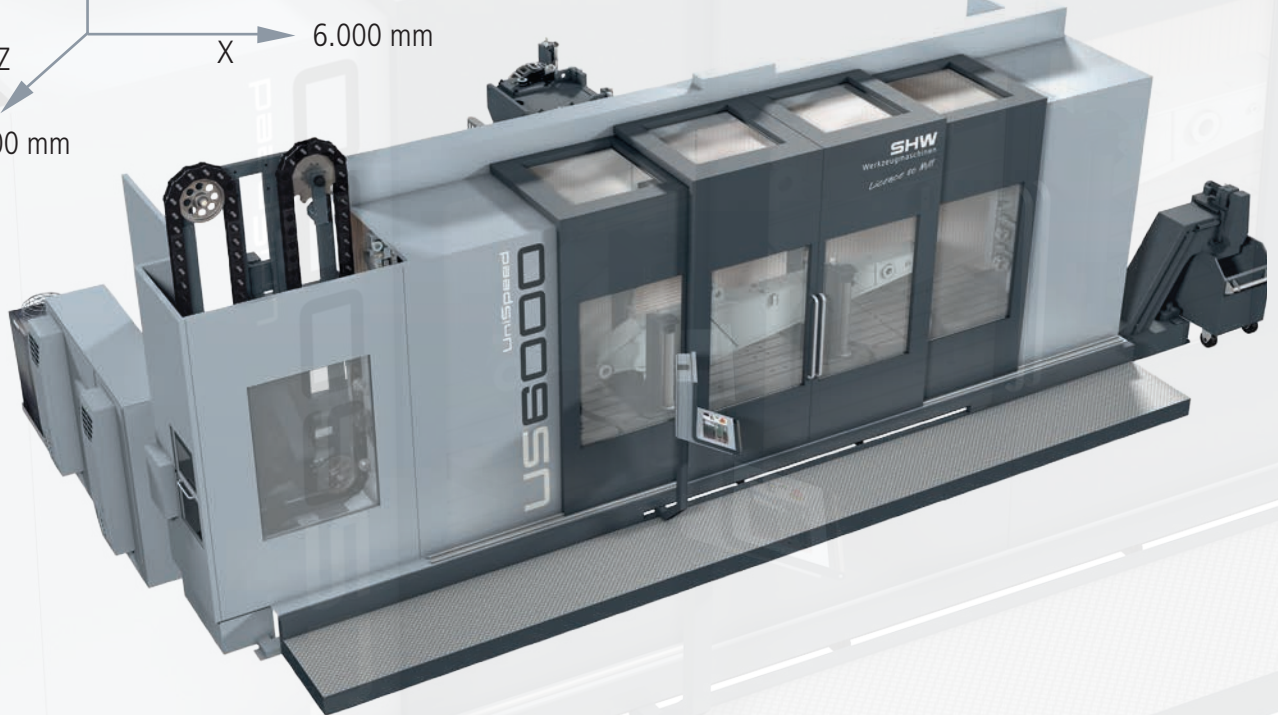
Gear
Wheel
Milling

Remote
Desktop

UniSpeed 6000

Depending on the specific requirement, the UniSpeed 6000 can be equipped with a partition wall. This allows shuttle machining or enables setting in one working area while in the other one machining can take place. Components up to a size of $X = 6000$ mm can be processed without difficulty.

1.600 mm
Y
1.300 mm
Z
X
6.000 mm



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Compact. Universal. Fast.



Technical Data

Working areas / Travels			Clamping surfaces		
X axis (horizontal longitudinal)	mm	6.000	Clamping table	mm	6.000 X 1.200
Y axis (vertical)	mm	1.600	Rotary/turning table	mm	Ø 1.200
Z axis (horizontal cross)	mm	1.300			
Orthogonal milling head	degree(°)	1° indexing (64.800 head positions) infinitely variable	Rotary table		
			Speeds	rpm	8
			Torque	Nm	4.200
			Table load	kg	2.000
Main drive/Motor spindle			Turning table		
Drive power	kW	bis 44/70	Speeds	rpm	500
Speed range	rpm	bis 8.000/24.000	Torque	Nm	1.600
			Table load	kg	2.000
Feeds and rapid traverses			ATC		
X, Y, Z axis	mm/min	0-30.000	Number of pockets		bis 2 X 180
Acceleration of the linear axis	m/s ²	3,5	Tool Taper		SK 50 BIG-PLUS
Machine weight	kg approx.	ca. 50.000	Option		HSK 100 A DIN 69893
CNC-system		Siemens 840D sl Heidenhain TNC 640			

Your Benefits



Milling Head

Full power in any head position.
64.8000 machining positions,
available with 1° indexing or
infinitely variable



Shuttle machining

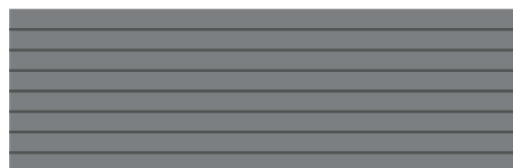
A dividing wall within the
working area enables
shuttle machining operation
and offers the possibility
of setting parallel to the
machining time.



Working area

The variable configuration
of the working area
provides numerous possibili-
ties to machine a
component.

Configurable working area



Equipment features

Mill
and
Turn

without
foundation

Floor
Level

Energy
Efficient

Remote
Diagnosis

Milling Head
Measure-
ment

Hybrid
Construc-
tion

Camera

Options

Component handling:

- Clamping plate
- Rotary table(s)
- Turning table(s)
- Pallet changer

Tool handling:

- ATC
- Tool magazine



Accuracies

Positional uncertainty	X-axis Y,Z-axes	P = 22 μm P = 13 μm
Positional scatter	X-axis Y,Z-axes	Ps = 14 μm Ps = 9 μm
Positional deviation	X-axis Y-axis Z-axis	Pa = 12 μm Pa = 6 μm Pa = 5 μm
Reversal error		U = 5 μm

Milling heads



Universal milling head

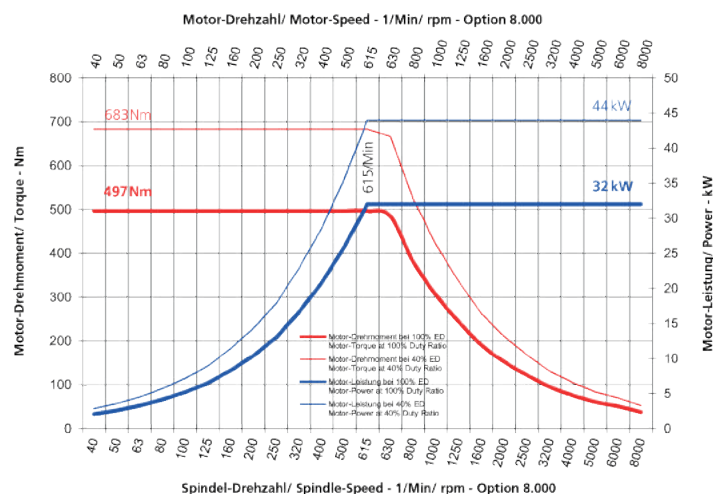
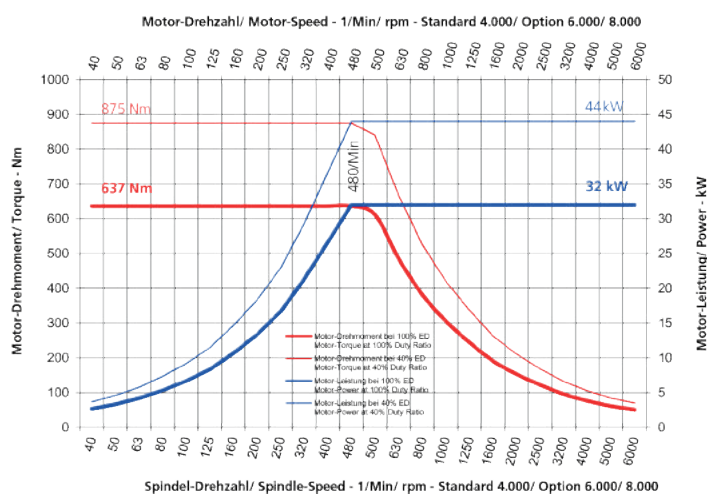


Fork milling head



Special milling heads

Performance Diagram



Versions

- Milling machine
- Mill-turning machine

Head
compensa-
tion

clamping
System

Uni
Scan

Interpolation
Turning

Non
Circular
Turning

Gear
Wheel
Milling

Remote
Desktop

Pallet Changing System

UniSpeed 2000 // 3000



Your Benefits

- Unmanned production
- Partial automation
- Increased efficiency
- Reduction of idle times of the spindle
- Avoidance of non-productive times
- Set-up parallel to production time
- Upgradeable

Technical Data

- Pallet size mm Ø 1.600/1.800/2.000
 Individual solutions
- Table load kg up to 8.000



Options

- Media transfer through the pallet
- In the pallet integrated zero-point clamping system
- Hydraulic component clamping
- Slot pattern for turning functions inclusive of adapter for jaw box
- Rotating setting station

Twin Pallet Changer



With its two pallets, the economic base model allows set-up parallel to production time. This results in a considerable increase in productivity while maintaining a low space requirement.

Our new transfer unit makes machine and pallet changing unit into two independent units. Due to this characteristic it is possible to retrofit - with reasonable costs - the twin pallet changer to existing UniSpeed machines.

Linear Pallet Changer



Apart from the possibility to accommodate any number of pallets, the linear pallet changer allows the option of machine interlinking, in order to automate the individual process steps.

The linear pallet changer is characterized by its very low installation depth. A flexible arrangement of setting and deposit stations gives you the maximum flexibility for a process-oriented production.

Retrofitting is possible.

Rotary Pallet Pool



The up to 4 pallets are arranged around the machine in star shape. The setting station, oriented towards the control panel of the UniSpeed, grants an optimized workflow.

This rotary pallet pool offers a variety of configurations, tailor made for your production tasks.

Retrofitting is possible.



Travelling Column Machines

PowerSpeed 2000 // PowerSpeed 4000
UniForce 4000 // UniForce 7000



PowerSpeed 2000

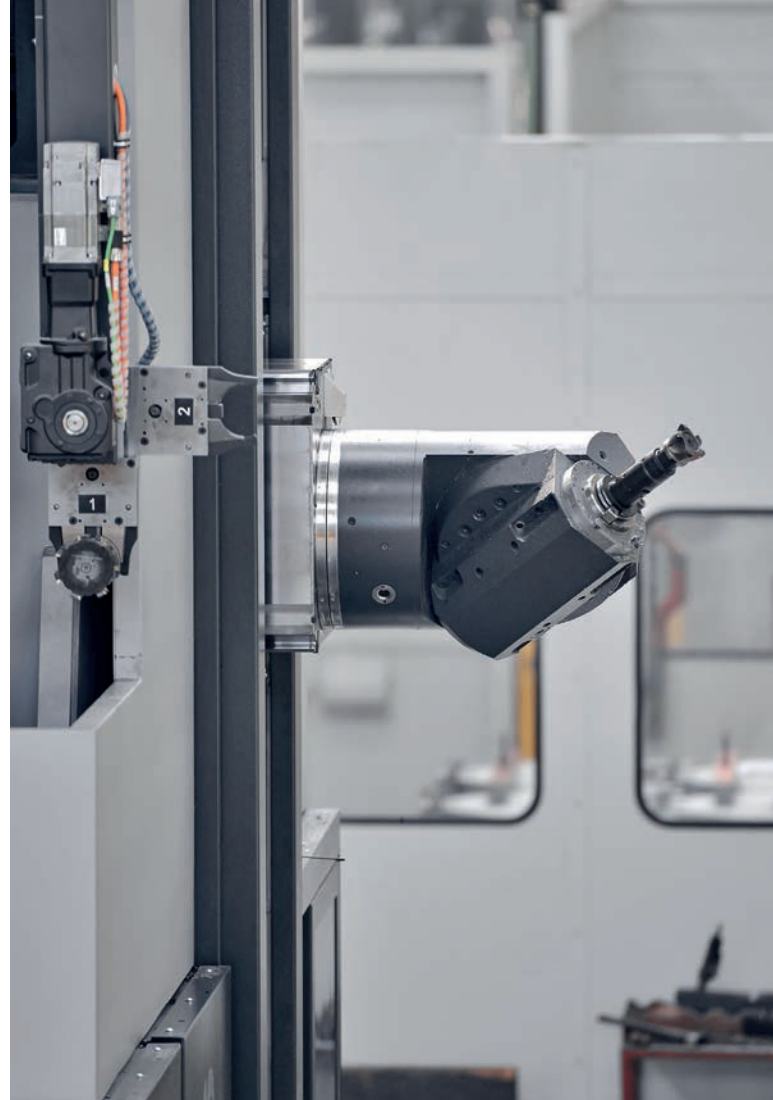
The PowerSpeed 2000 is a travelling column machine for large components. Its versatile and individual configuration is an advantage for single part and small lot production, especially in the tool manufacture and in mechanical engineering

2.600 mm
Y
30.000 mm
X
1.300 mm
Z

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Dynamic. Powerful. Versatile.



Technical Data

Working areas / Travels			Clamping surfaces	freely configurable
X axis (horizontal longitudinal)	mm	bis 30.000		
Y axis (vertical)	mm	bis 2.600		
Z axis (horizontal cross)	mm	bis 1.300		
Orthogonal milling head	degree(°)	1° indexing (64.800 head positions) infinitely variable	ATC	
			Number of pockets	travelling - up to 150 Special solutions possible
Main drive/Motor spindle			Tool Taper	SK 50 BIG-PLUS
Drive power	kW	bis 44/70	Option	HSK 100 A DIN 69893
Speed range	rpm	up to 8.000/24.000		
Feeds and rapid traverses			CNC-system	Siemens 840D sl Heidenhain TNC 640
X, Y, Z axis	mm/min	0-30.000		
Acceleration of the linear axes	m/s ²	3,5		
Machine weight		depending on travels		

Ihre Vorteile



Shuttle machining

Reduction of unproductive times and set-up parallel to machining time increase your efficiency and extend the processing possibilities



Housing

Whether you choose the classic 3-sided-protection or a complete housing, the working area can be designed according to your requirements and completely CE compliant



Head change

The use of different milling heads enables a wide range of processing tasks



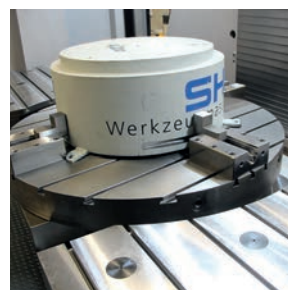
Travels

X travels of up to 30.000 grant accommodation and machining of the largest components



Turning and milling

Equipped with a turning table, the PowerSpeed becomes a "Multi tool", combining turning and milling operations in one set-up



Working area

The variable configuration of the working area creates the conditions for an effective processing of your individual machining tasks

Equipment features

Mill
and
Turn

without
foundation

Floor
Level

Energy
Efficient

Remote
Diagnosis

Milling Head
Measure-
ment

Hybrid
Construc-
tion

Camera

Options

Component handling:

Clamping plate
Rotary table(s)
Rotary table(s) with cross (W) axis
Turning table(s)
Turning table(s) with cross (W) axis
Reversible clamping device
Pallet changer

Tool handling:

Travelling ATC
Tool Center stationary at end of X travel
Tool Pick-Up
Special solutions



Accuracies

Axes X, Y, Z

Positional uncertainty
Positional scatter
Positional deviation
Reversal error

$P = 10 \mu\text{m} + 2 \mu\text{m}$ per each meter of travel
 $P_s = 7,5 \mu\text{m} + 1 \mu\text{m}$ per each meter of travel
 $P_a = 0,15 \mu\text{m} \times \sqrt{L_{\text{max}}}$ [Lmax in mm]
 $U = 5 \mu\text{m}$

Milling heads



Universal milling head

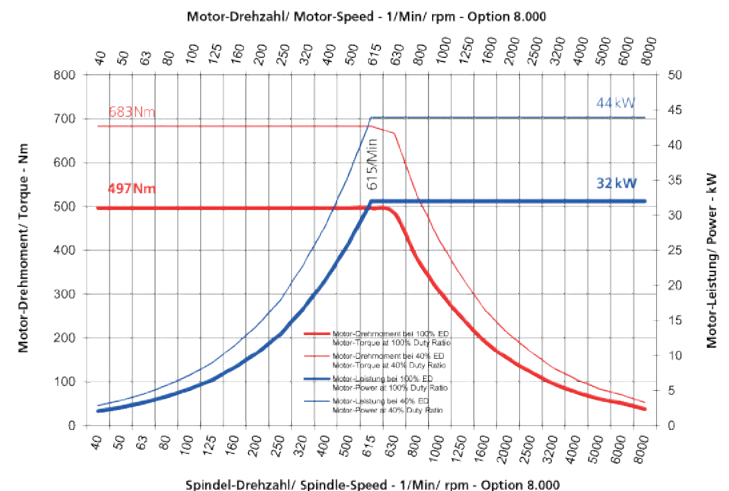
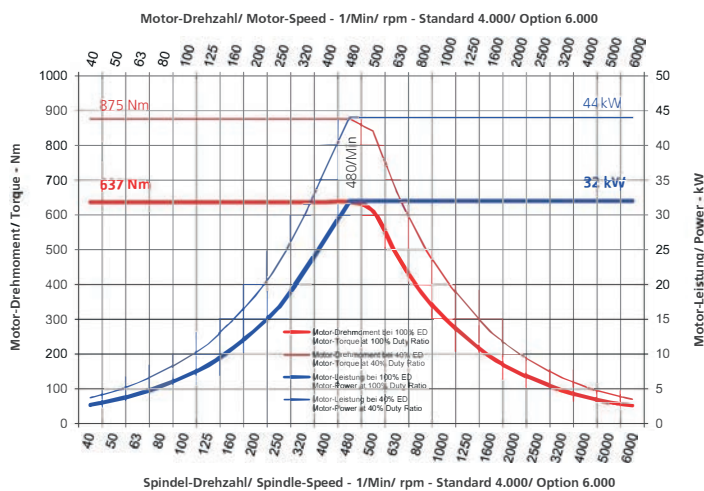


Fork milling head



Special milling heads

Performance Diagram



Versions

- Milling machine
- Turning-milling machine
- Pallet changing machine
- Head change machine
- Twin column machine

Head
compensa-
tion

Tight
Block

clamping
System

Uni
Scan

Interpolation
Turning

Non
Circular
Turning

Gear
Wheel
Milling

Remote
Desktop

PowerSpeed 4000

The PowerSpeed 4000 is the Allrounder among the travelling column machines. Due to its travel range almost all required machining operations are possible. Impressive – apart from its design – is the high capacity of up to 75 kW, its travel speed of up to 40.000 mm/min. A large number of options is available.

4.100 mm
Y
Z
X
40.000 mm
1.600 mm

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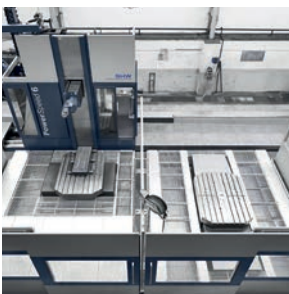
Dynamic. Powerful. Versatile.



Technical Data

Working areas / Travels			Clamping surfaces	freely configurable
X axis (horizontal longitudinal)	mm	bis 40.000		
Y axis (vertical)	mm	bis 4.100		
Z axis (horizontal cross)	mm	bis 1.600		
Orthogonal milling head	degree(°)	1° indexing (64.800 head positions) infinitely variable	ATC	
			Number of pockets	travelling - up to 150 Special solutions possible
Main drive/Motor spindle			Tool Taper	SK 50 BIG-PLUS HSK 100 A DIN 69893
Drive power	kw	up to 75/70	Option	
Speed range	rpm	up to 8.000/24.000		
Feeds and rapid traverses			CNC-system	Siemens 840D sl Heidenhain TNC 640
X, Y, Z axis	mm/min	0-40.000		
Acceleration of the linear axes	m/s ²	3,5		
Machine weight		depending on travels		

Your Benefits



Shuttle machining

Reduction of unproductive times and set-up parallel to machining time increase your efficiency and extend the processing possibilities



Housing

Whether you choose the classic 3-sided-protection or a complete housing, the working area can be designed according to your requirements and completely CE compliant



Head change

The use of different milling heads enables a wide range of processing tasks



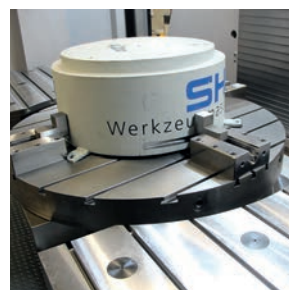
Travels

X travels of up to 40.000 grant accommodation and machining of the largest components



Turning and milling

Equipped with a turning table, the PowerSpeed becomes a "Multi tool", combining turning and milling operations in one set-up



Working area

The variable configuration of the working area create the conditions for an effective processing of your individual machining tasks

Equipment features

Mill
and
Turn

without
foundation

Floor
Level

Energy
Efficient

Remote
Diagnosis

Milling Head
Measure-
ment

Hybrid
Construc-
tion

Camera

Options

Component handling:

Clamping plate
Rotary table(s) with cross (W) axis
Turning table(s) with cross (W) axis
Reversible clamping device
Pallet changer

Tool handling:

Travelling ATC
Tool Center stationary at end of X travel
Tool Pick-Up
Special solutions

Accuracies

Axes X, Y, Z

Positional uncertainty
Positional scatter
Positional deviation
Reversal error

$P = 10 \mu\text{m} + 2\mu\text{m}$ per each meter of travel
 $P_s = 7,5 \mu\text{m} + 1\mu\text{m}$ each meter of travel
 $P_a = 0,15 \mu\text{m} \times \sqrt{L_{\text{max}}}$ [L_{max} in mm]
 $U = 5 \mu\text{m}$



Milling heads



Universal milling head

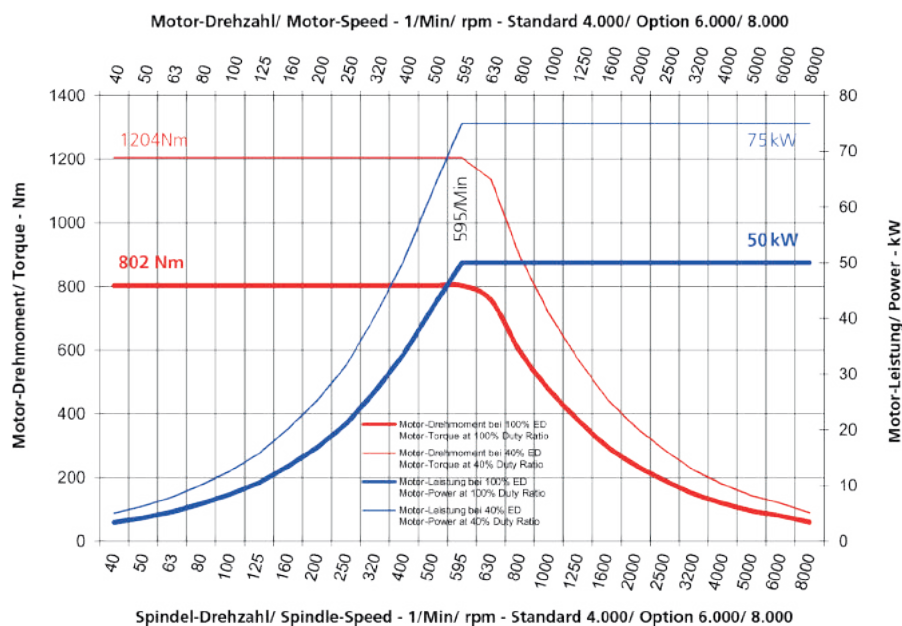


Fork milling head



Special milling heads

Performance Diagram



Versions

- Milling machine
- Turning-milling machine
- Pallet changing machine
- Head change machine
- Twin column machine

Head
compensa-
tion

Tight
Block

clamping
System

Uni
Scan

Interpolation
Turning

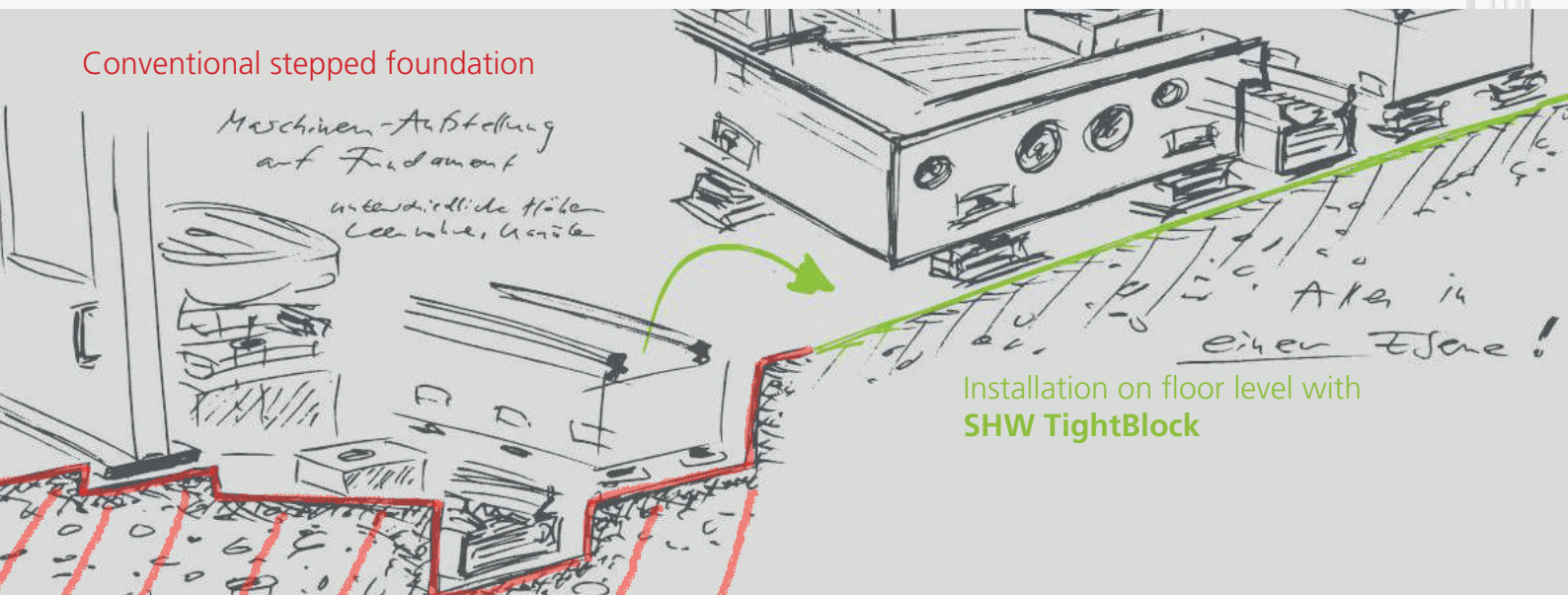
Non
Circular
Turning

Gear
Wheel
Milling

Remote
Desktop

TightBlock

Conventional stepped foundation



Installation on floor level with
SHW TightBlock

Concept

The TightBlock concept offers the possibility to install on floor level a travelling column machine (PowerSpeed) with an X travel of up to 8.000 mm. This is accomplished by the massive construction of the TightBlock, which consists of a welded steel construction, filled with polymer concrete.

Highlights

- Installation of the travelling column machine on floor level
- Freely configurable, liquid tight, enclosed working area
- Integrated chip and coolant management
- Integrated, protected media supply for the periphery
- Composite construction with a high mass for optimal damping

Your Benefits

- Flexible positioning / simple machine relocation (block foundation / a floor plate is sufficient)
- Safe working environment
- Clean work place
- Low noise level with full enclosure
- High rigidity, high precision

Options

- Three-sided protective wall
- Complete housing
- Shuttle machining
- Configurable set-up situation
- Clamping plate // rotary table // turning table
- Pallet changer
- Various tool change concepts



Aufstellung mit
TightBlock

With regard to the configuration of the working area, the TightBlock concept has almost no limits – it can be “customized” to your particular requirements.



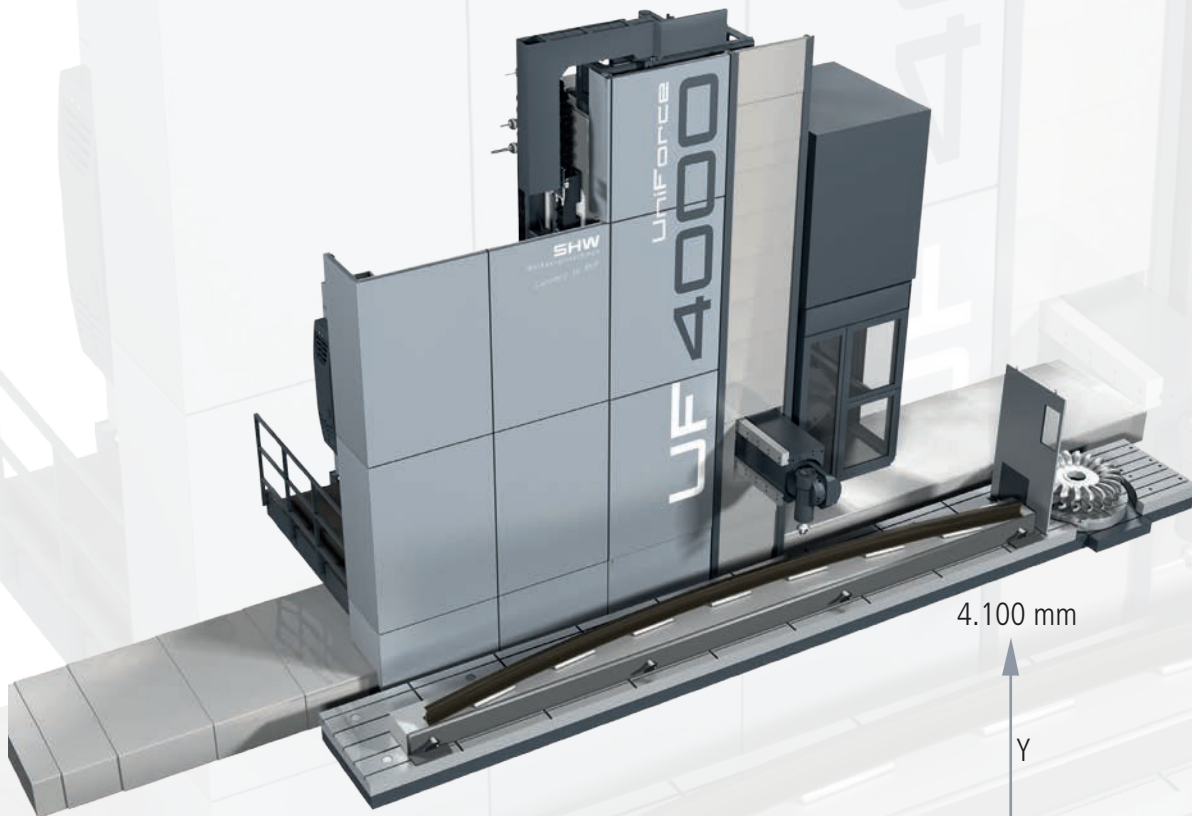
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mit SHW T

In addition, this TightBlock concept offers, besides the three-sided protection wall, the possibility of a full housing for the working area. This results in a logical continuation of an installation on floor level, typical for machining centers, but not restricted to the dimensions of the UniSpeed series.



UniForce 4000

Precision and robustness are the special merits of the UniForce 4000. This machine is ideally suited for heavy-duty machining of small and large dimensions.



4.100 mm

Y

Z

X

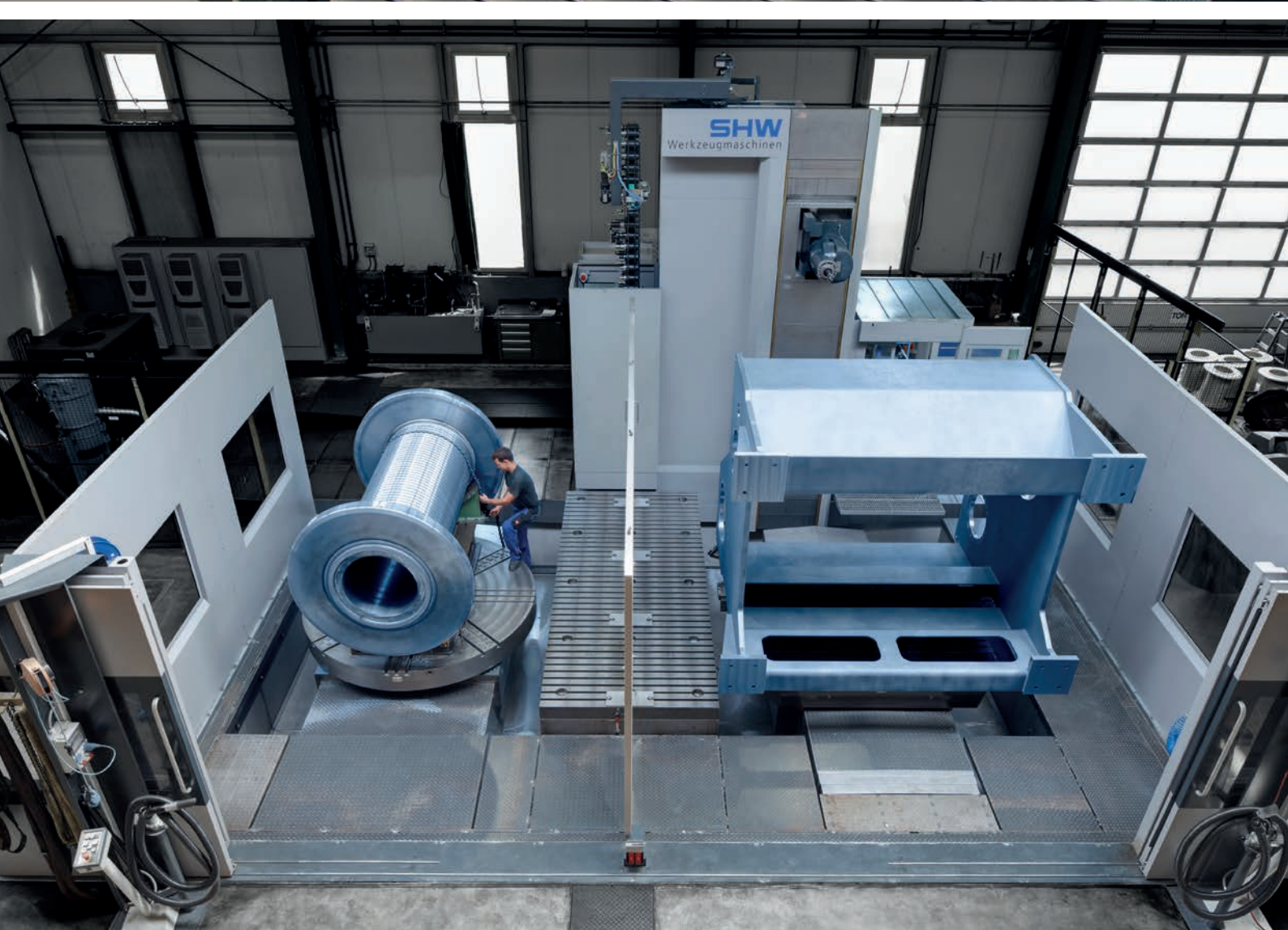
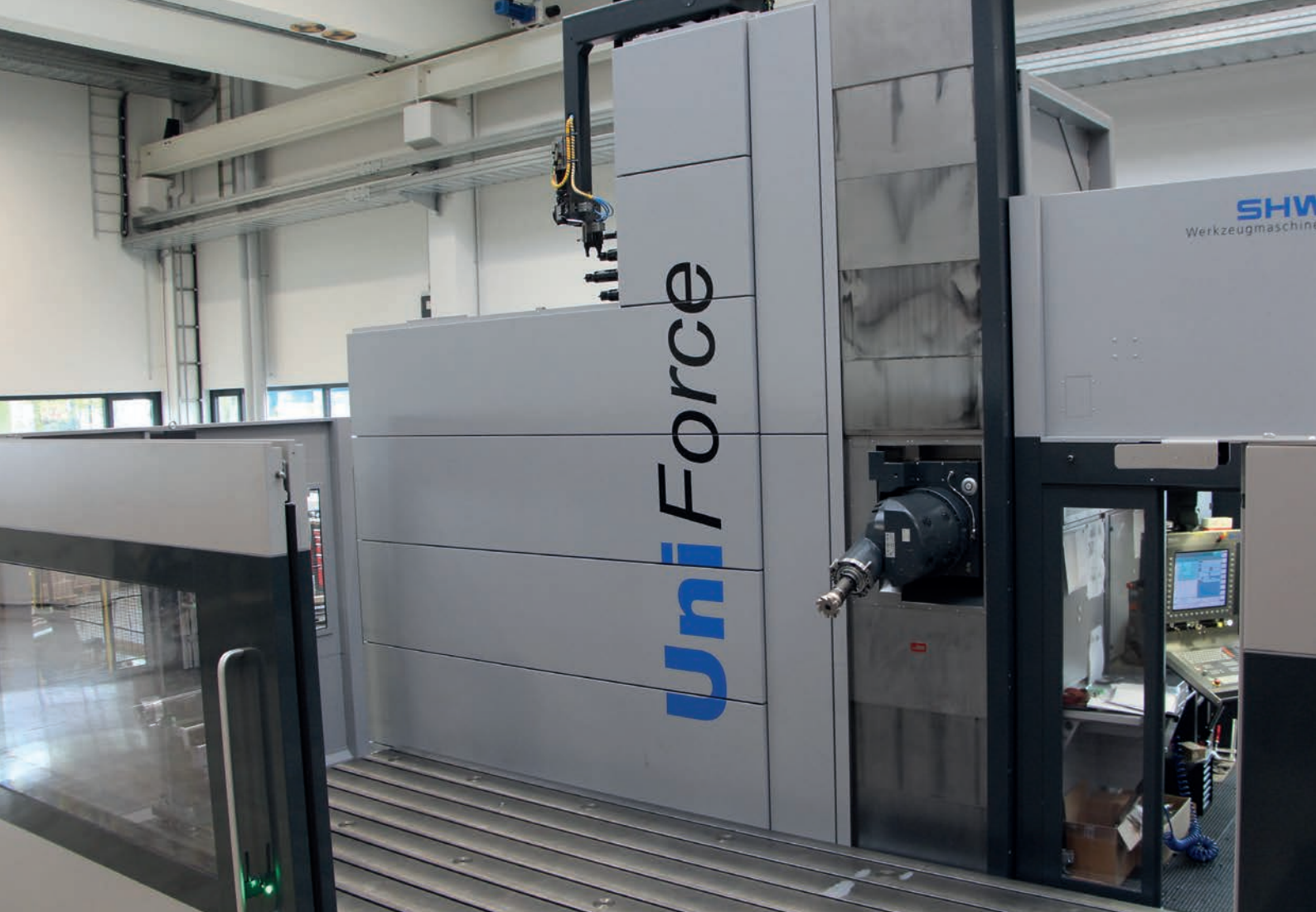
40.000 mm

1.600 mm

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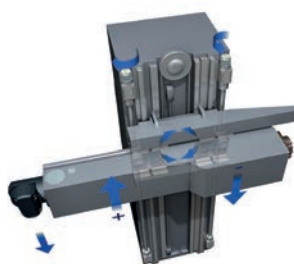
Big. Strong. Flexible.



Technical Data

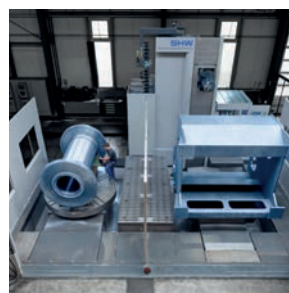
Working areas / Travels			Clamping surfaces	freely configurable
X axis (horizontal longitudinal)	mm	up to 40.000		
Y axis (vertical)	mm	up to 4.100		
Z axis (horizontal cross)	mm	up to 1.600		
Orthogonal milling head	degree(°)	1° indexing (64.800 head positions) infinitely variable	ATC	
			Number of pockets	travelling - up to 180 Special solutions possible
Main drive/Motor spindle			Tool Taper	SK 50 BIG-PLUS HSK 100 A DIN 69893
Drive power	kW	up to 75/70	Option	
Speed range	rpm	up to 5.000/24.000		
Feeds and rapid traverses			CNC-system	Siemens 840D sl Heidenhain TNC 640
X axis	mm/min	0-36.000		
Y,Z axis	mm/min	0-24.000		
Acceleration of the linear axes	m/s ²	2		
Machine weight		depending on travels		

Your Benefits



Duo Drive

Electromechanical adjustment via 2 independent vertical recirculating ball screws in connection with each an independent measuring system. This ensures the plane-parallel extension of the headstock



Shuttle machining

Reduction of unproductive times and set-up parallel to machining time increase your efficiency and extend the processing possibilities



Head change

The use of different milling heads enables a wide range of processing tasks



Turning and milling

Equipped with a turning table, the PowerSpeed becomes a "Multi tool", combining turning and milling operations in one set-up



Housing

Whether you choose the classic 3-sided-protection or a complete housing, the working area can be designed according to your requirements and completely CE compliant



Pick-Up

The tool Pick-Up provides the tools directly at the working position. Reduced chip-to-chip time optimize your machine hour rates.

Equipment features

Mill
and
Turn

Energy
Efficient

Remote
Diagnosis

Milling Head
Measure-
ment

Duo
Drive

Hybrid
Construc-
tion

Camera

Head
compensa-
tion

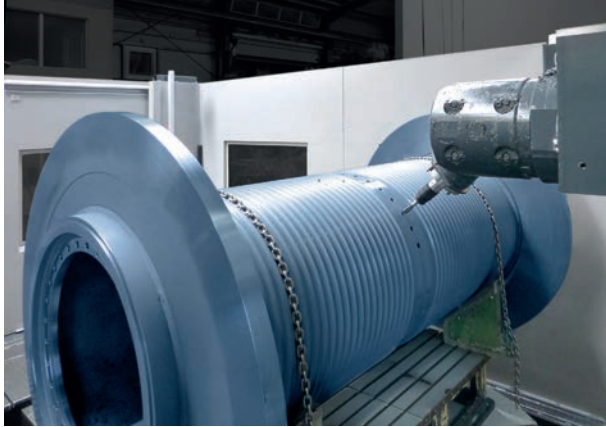
Options

Component handling:

Clamping plate
Rotary table(s)
Rotary tables with cross (W) axis
Turning table(s)
Turning tables with cross (W) axis
Reversible clamping device
Pallet changer

Tool handling:

Travelling ATC
Tool Center stationary at end of X travel
Tool Pick-Up
Special solutions



Accuracies

Axes X, Y, Z

Positional uncertainty
Positional scatter
Positional deviation
Reversal error

$P = 15 \mu\text{m} + 2 \mu\text{m}$ per each meter of travel
 $Ps = 7,5 \mu\text{m} + 1 \mu\text{m}$ per each meter of travel
 $Pa = 0,2 \mu\text{m} \times \sqrt{L_{\text{max}}}$ [L_{max} in mm]
 $U = 5 \mu\text{m}$

Milling heads



Universal milling head

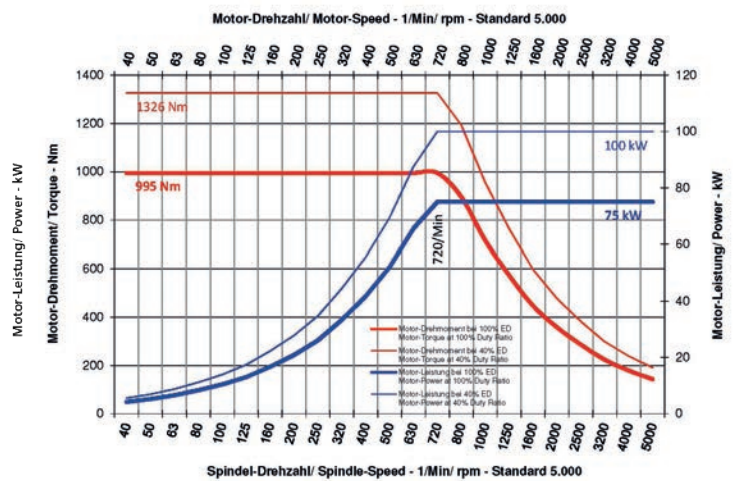
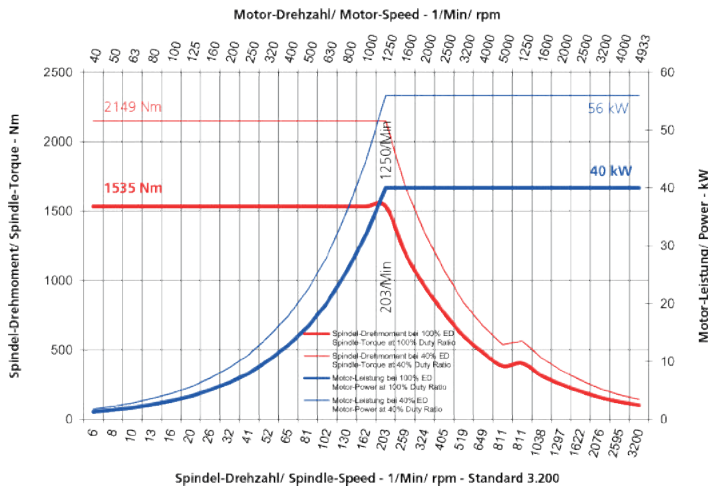


Fork milling head



Special milling heads

Performance Diagram (Extract)



Versions

- Milling machine
- Turning-milling machine
- Head change machine
- Twin column machine
- Pallet changing machine

clamping
System

Uni
Scan

Interpolation
Turning

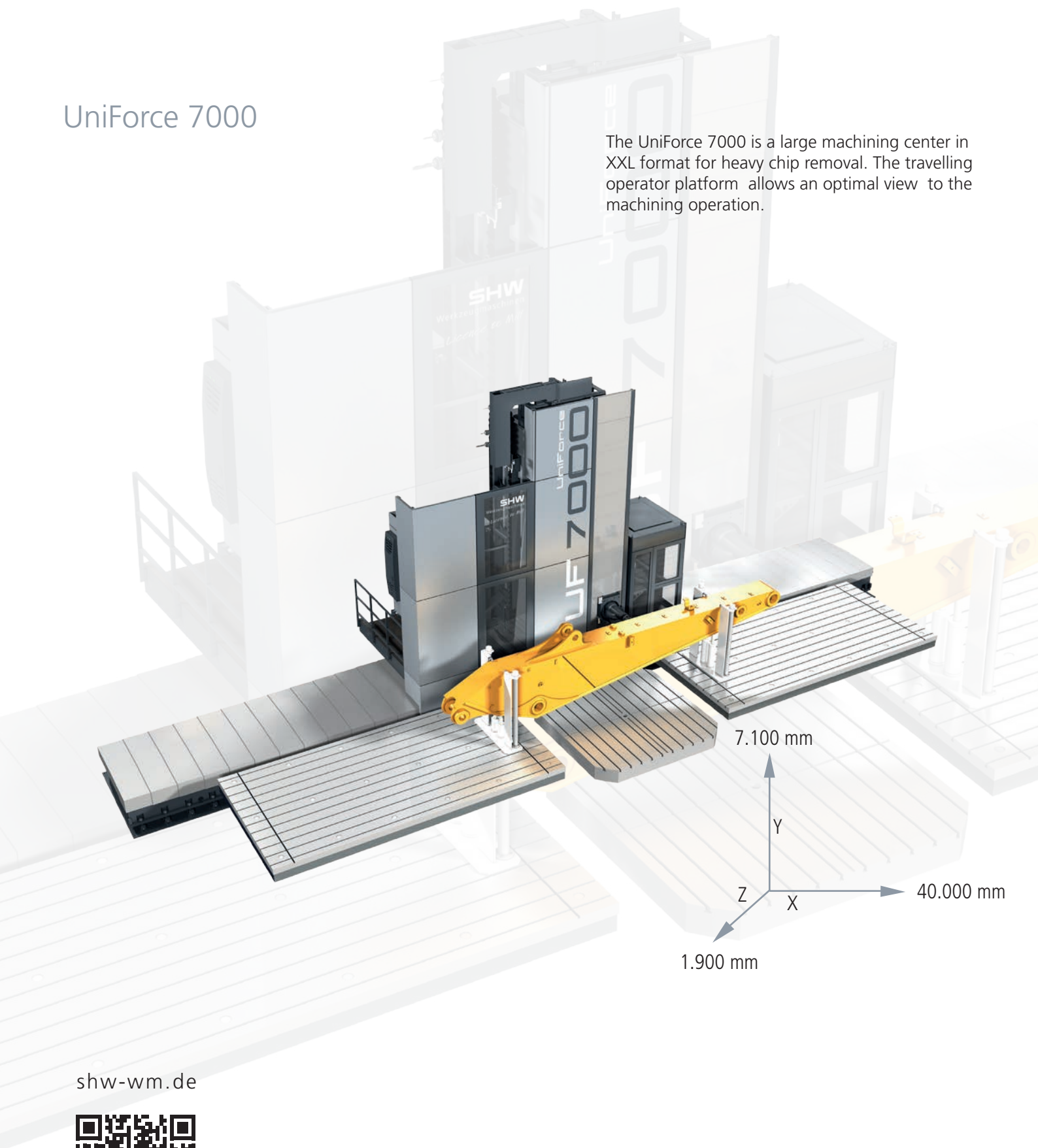
Non
Circular
Turning

Gear
Wheel
Milling

Remote
Desktop

UniForce 7000

The UniForce 7000 is a large machining center in XXL format for heavy chip removal. The travelling operator platform allows an optimal view to the machining operation.



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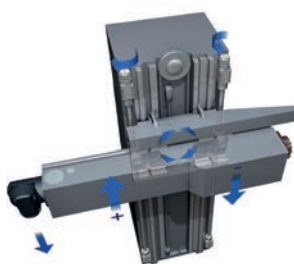
Large. Strong. Flexible.



Technical Data

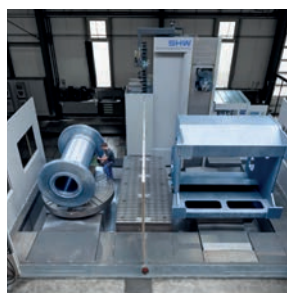
Working areas / Travels			Clamping surfaces	freely configurable
X axis (horizontal longitudinal)	mm	up to 40.000		
Y axis (vertical)	mm	up to 7.100		
Z axis (horizontal cross)	mm	up to 1.900		
Orthogonal milling head			ATC	
	degree(°)	1° indexing (64.800 head positions) infinitely variable	Number of pockets	travelling - up to 120 Special solutions possible
Main drive/Motor spindle			Tool Taper	SK 50 BIG-PLUS HSK 100 A DIN 69893
Drive power	kW	up to 100/70	Option	
Speed range	rpm	up to 5.000/24.000		
Feeds and rapid traverses			CNC-system	Siemens 840D sl Heidenhain TNC 640
X axis	mm/min	0-30.000		
Y,Z axis	mm/min	0-24.000		
Acceleration of the linear axes	m/s ²	2		
Machine weight		depending on travels		

Your Benefits



Duo Drive

Electromechanical adjustment via 2 independent vertical recirculating ball screws in connection with each an independent measuring system. This ensures the plane-parallel extension of the headstock



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Head change

The use of different milling heads enables a wide range of processing tasks



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Equipped with a turning table, the PowerSpeed becomes a "Multi tool", combining turning and milling operations in one set-up



Housing

Whether you choose the classic 3-sided-protection or a complete housing, the working area can be designed according to your requirements and completely CE compliant



Pick-Up

The tool Pick-Up provides the tools directly at the working position. Reduced chip-to-chip timed optimize your machine hour rates.

Equipment features

Mill
and
Turn

Energy
Efficient

Remote
Diagnosis

Milling Head
Measure-
ment

Duo
Drive

Hybrid
Construc-
tion

Camera

Head
compensa-
tion

Options

Component handling:

Clamping plate
Rotary table(s)
Rotary tables with cross (W) axis
Turning table(s)
Turning tables with cross (W) axis
Reversible clamping device
Pallet changer

Tool handling:

Travelling ATC
Tool Center stationary at end of X travel
Tool Pick-Up
Special solutions



Accuracies

Axes X, Y, Z

Positional uncertainty
Positional scatter
Positional deviation
Reversal error

$P = 15 \mu\text{m} + 2 \mu\text{m}$ per each meter of travel
 $P_s = 7,5 \mu\text{m} + 1 \mu\text{m}$ per each meter of travel
 $P_a = 0,2 \mu\text{m} \times \sqrt{L_{\text{max}}}$ [Lmax in mm]
 $U = 5 \mu\text{m}$

Milling heads



Universal milling head

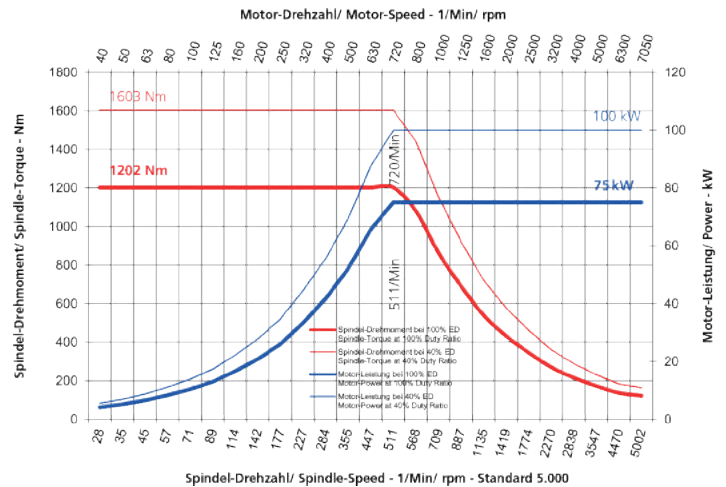
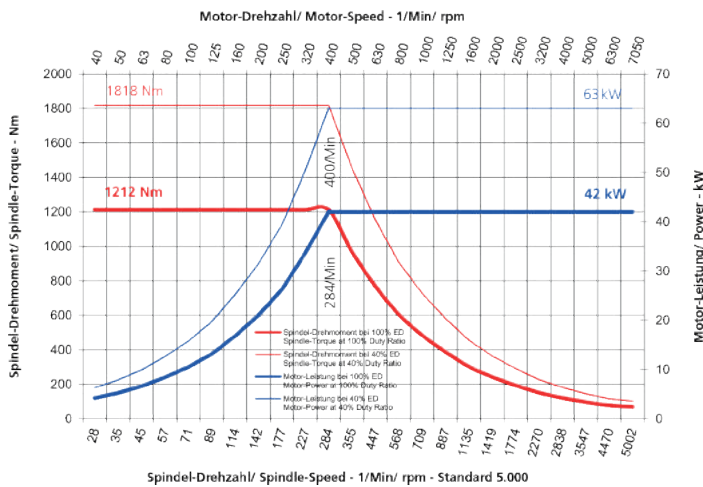


Fork milling head



Special milling heads

Performance Diagram (Extract)



Versions

- Milling machine
- Turning-milling machine
- Head change machine
- Twin column machine
- Pallet changing machine

clamping
System

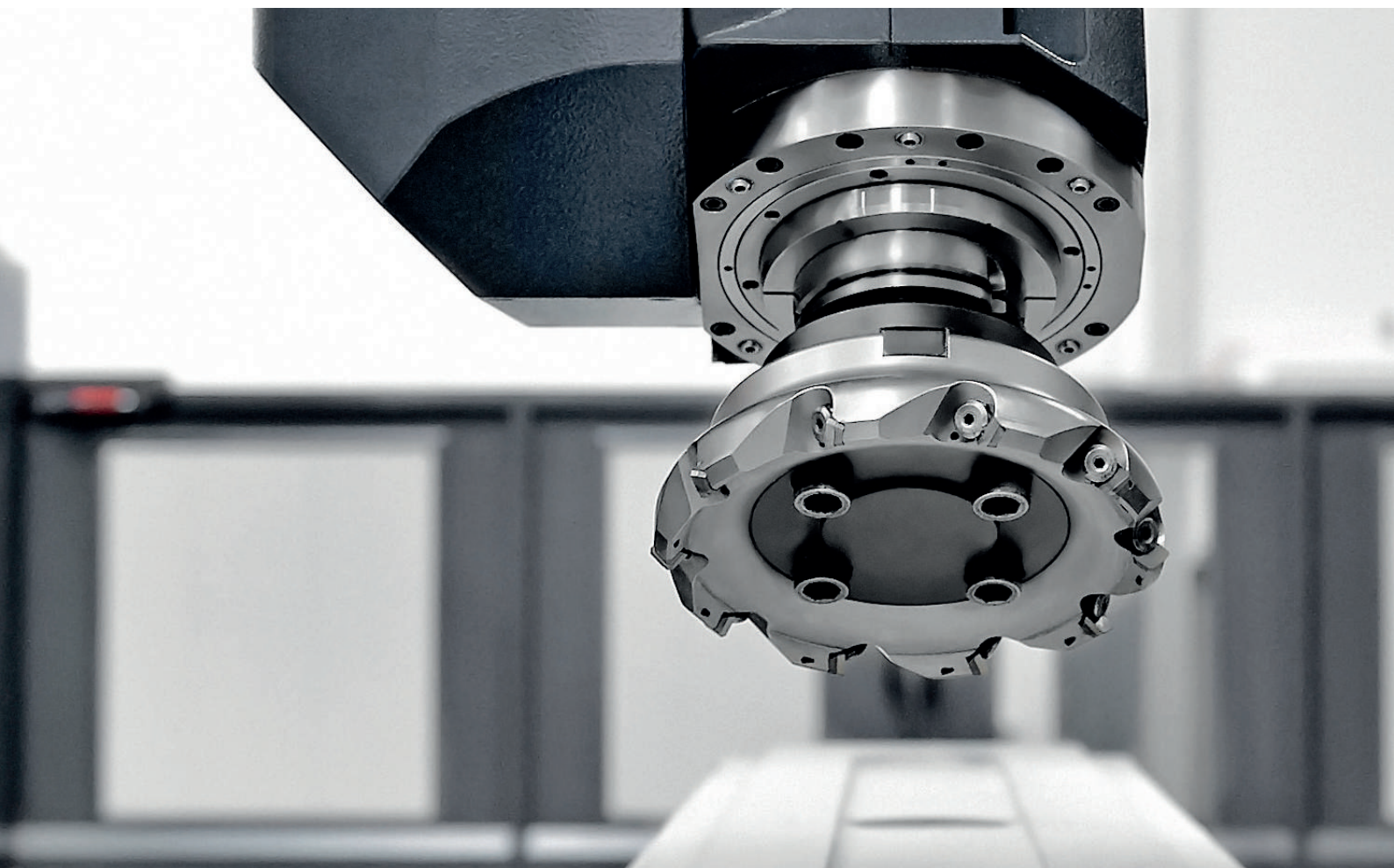
Uni
Scan

Interpolation
Turning

Non
Circular
Turning

Gear
Wheel
Milling

Remote
Desktop



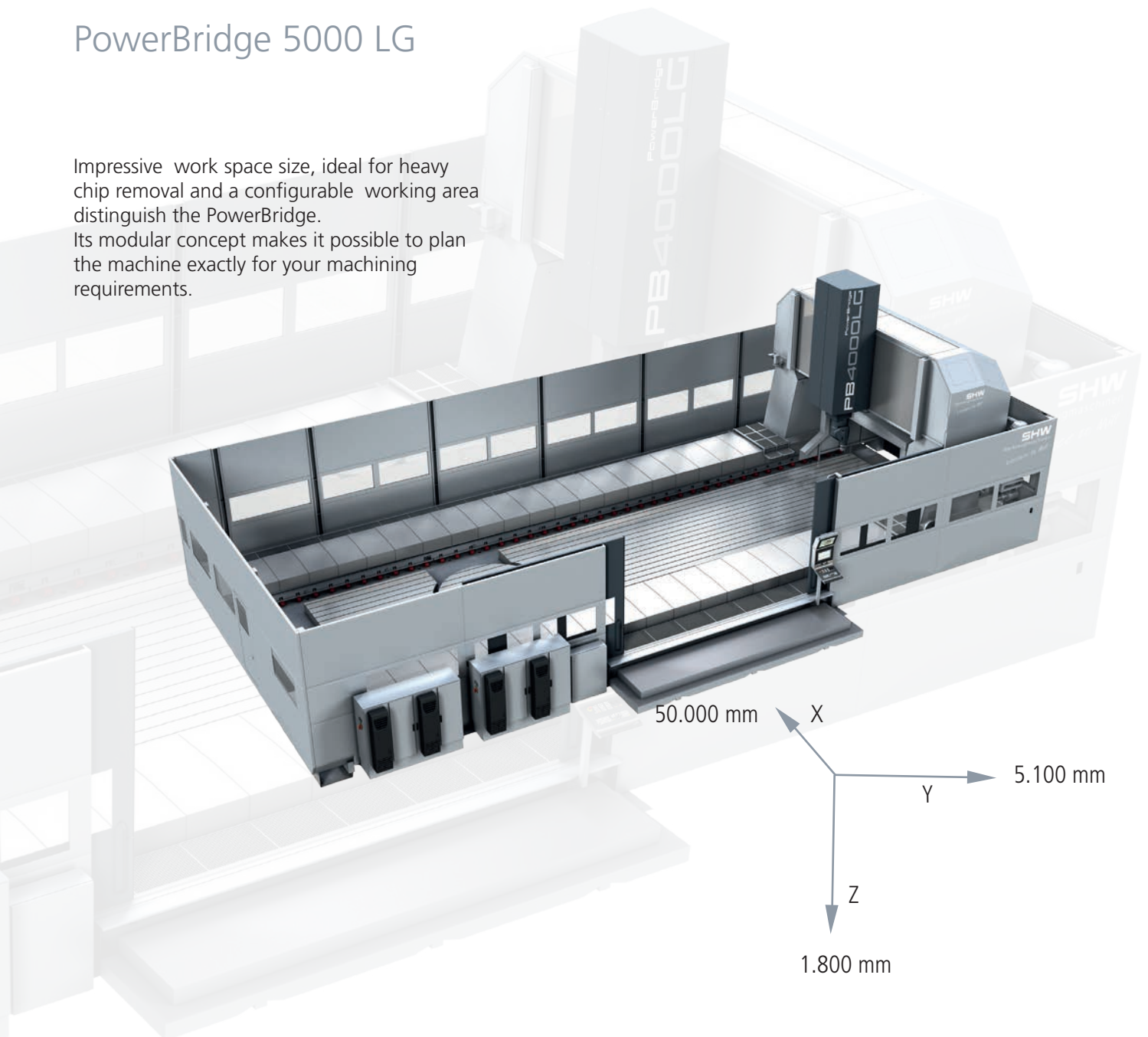
Gantry Machines

PowerBridge 5000 LG
PowerBridge 5000 HG



PowerBridge 5000 LG

Impressive work space size, ideal for heavy chip removal and a configurable working area distinguish the PowerBridge. Its modular concept makes it possible to plan the machine exactly for your machining requirements.



shw-wm.de



Powerful. Dynamic. Accurate.



Technical Data

Working areas / Travels			Clamping surfaces	freely configurable
X axis (horizontal longitudinal)	mm	up to 50.000		
Y axis (horizontal cross)	mm	up to 5.100		
Z axis (vertikal)	mm	up to 1.800		
Orthogonal milling head	A axis	degree(°) 1° indexing infinitely variable	ATC	
	C axis	infinitely variable	Number of pockets	freely configurable Special solutions possible
Main drive/Motor spindle			Tool Taper	SK 50 BIG-PLUS
Drive power	kW	up to 100/70	Option	HSK 100 A DIN 69893
Speed range	rpm	up to 6.000/24.000		
Feeds and rapid traverses			CNC-system	Siemens 840D sl Heidenhain TNC 640
X axis	mm/min	0-36.000		
Y,Z axis	mm/min	0-30.000		
Acceleration of the linear axes	m/s ²	2		
Machine weight		depending on travels		

Your Benefits



Head change

The use of different milling heads enables a wide range of processing tasks



Turning and milling

Equipped with a turning table, the PowerBridge becomes a "Multitool", combining turning and milling operations in one set-up



Operator Platform

The travelling platform permits any time an optimum view of the machining operations, without interference of the working area



Shuttle machining

An optional dividing wall enables shuttle machining operation with the result of a considerable reduction of unproductive times.



ATC

The travelling tool robot transports the tools - parallel to the machining time - to the transfer station. Due to the position of the tool magazine there are no interfering contours.

Equipment features

Mill
and
Turn

Energy
Efficient

Remote
Diagnosis

Milling Head
Measure-
ment

Hybrid
Construc-
tion

Camera

Head
compensa-
tion

clamping
System

Options

- Second machine bridge
- Fork head with motor spindle
- Splash guard cover
- Travelling operator platform



Accuracies

Axes X, Y, Z

Positional uncertainty

Positional scatter

Positional deviation

Reversal error

$P = 15 \mu\text{m} + 2 \mu\text{m}$ per each meter of travel

$P_s = 7,5 \mu\text{m} + 1 \mu\text{m}$ per each meter of travel

$P_a = 0,2 \mu\text{m} \times \sqrt{L_{\text{max}}}$ [L_{max} in mm]

$U = 5 \mu\text{m}$

Milling heads



Universal milling head

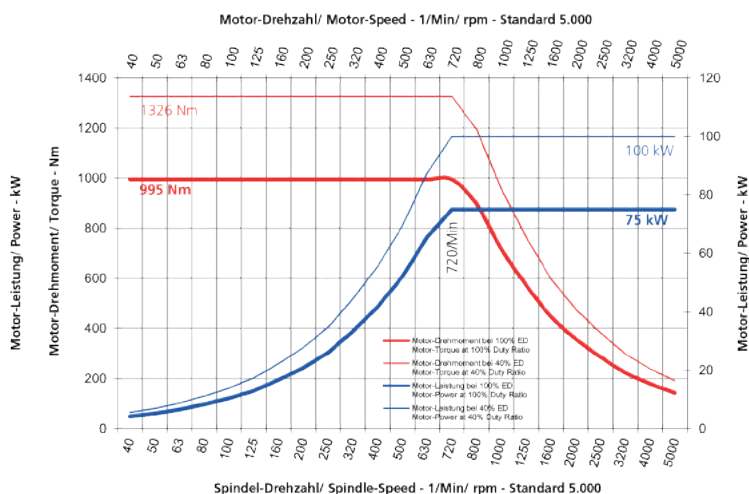
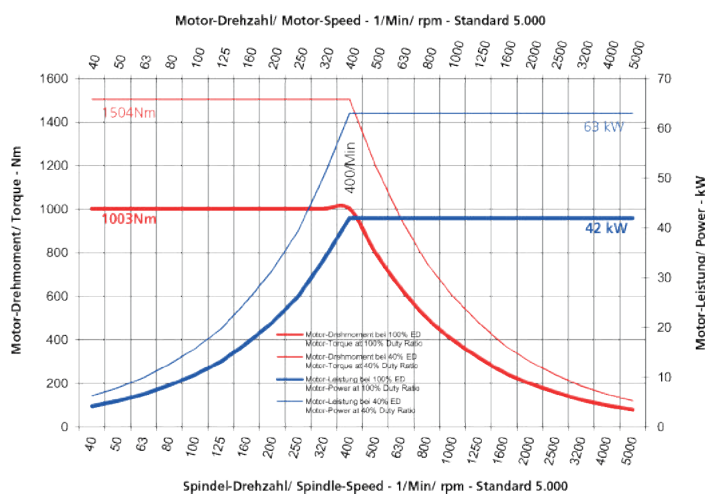


Fork milling head



Special milling heads

Performance Diagram



Versions

- Milling machine
- Turning-milling machine
- Head change machine

Uni
Scan

Interpolation
Turning

Non
Circular
Turning

Gear
Wheel
Milling

Remote
Desktop

PowerBridge 5000 HG

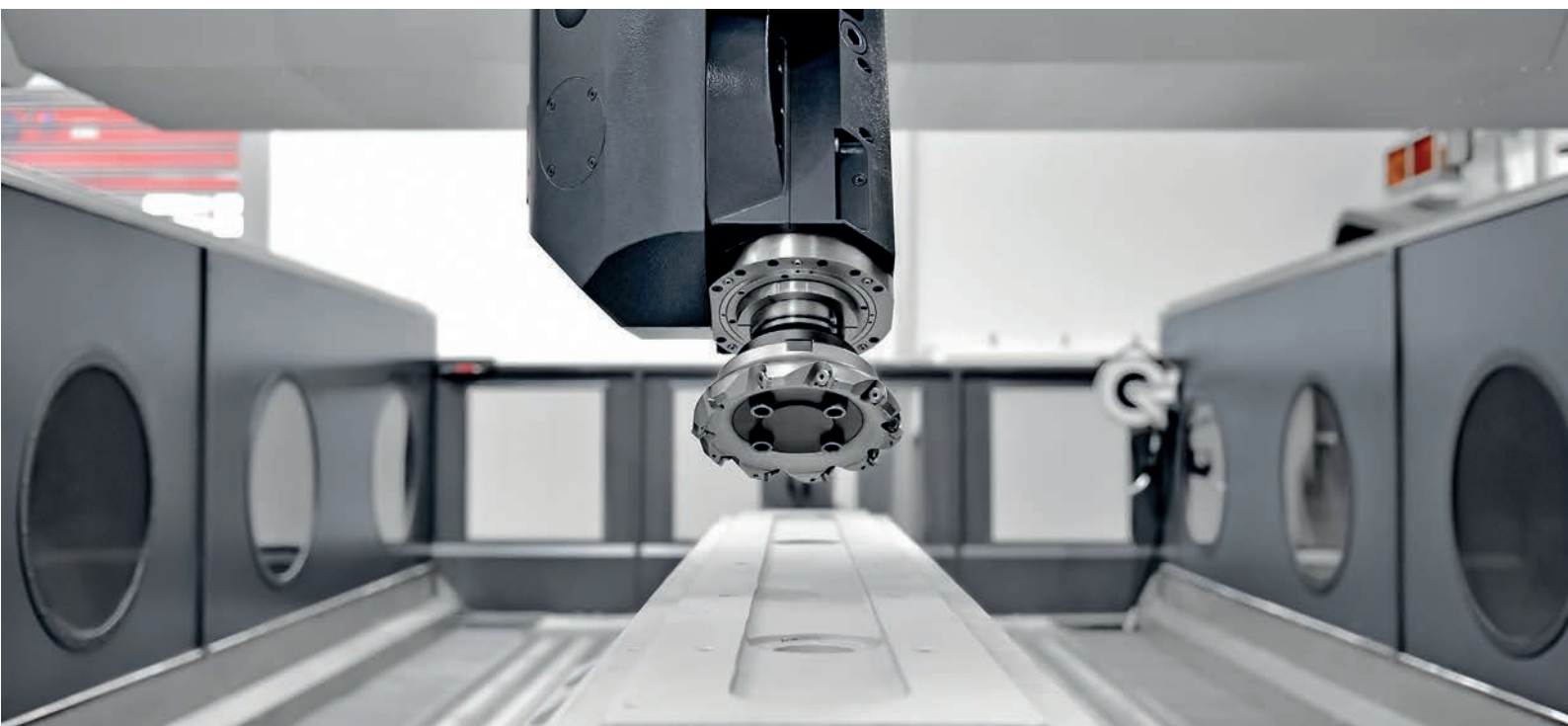
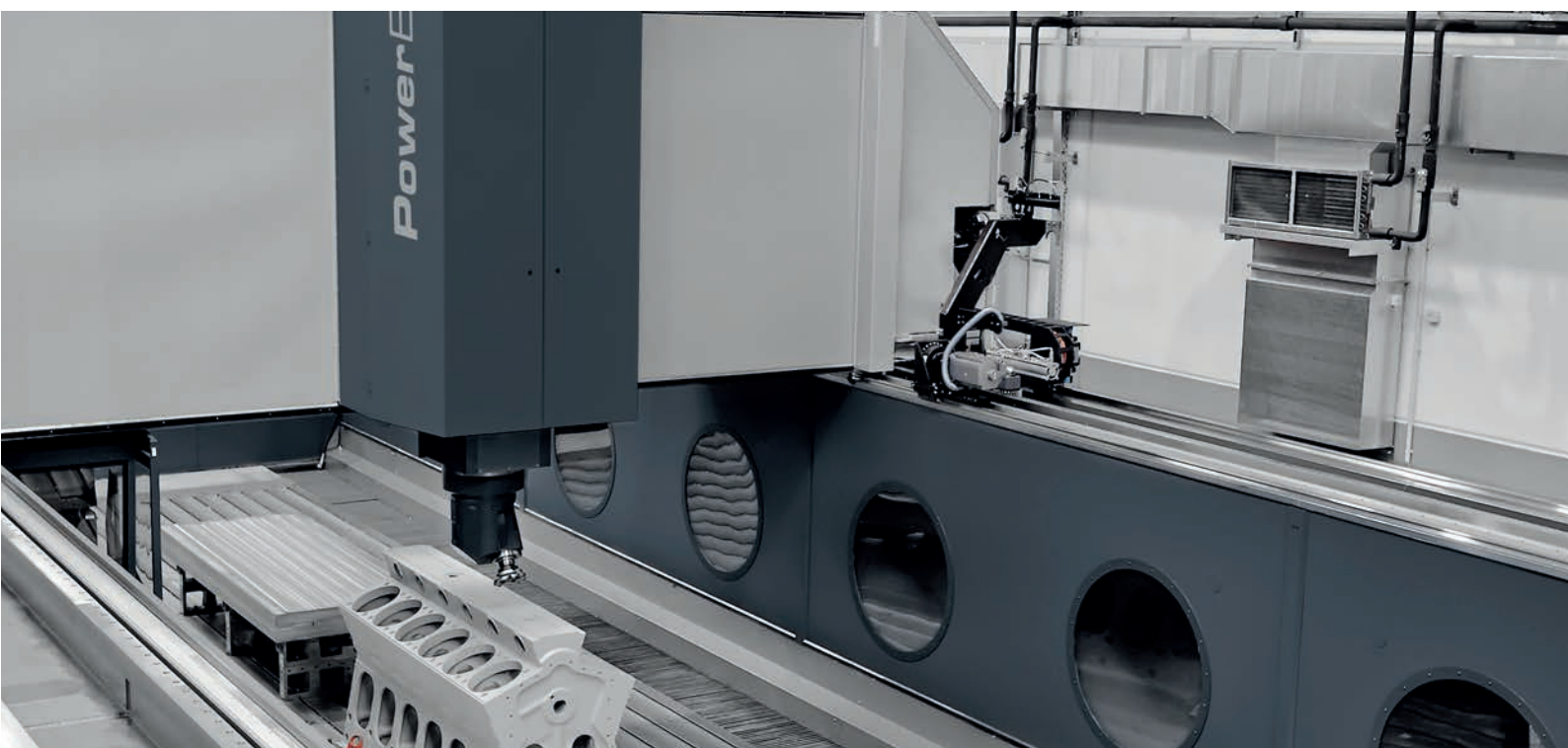
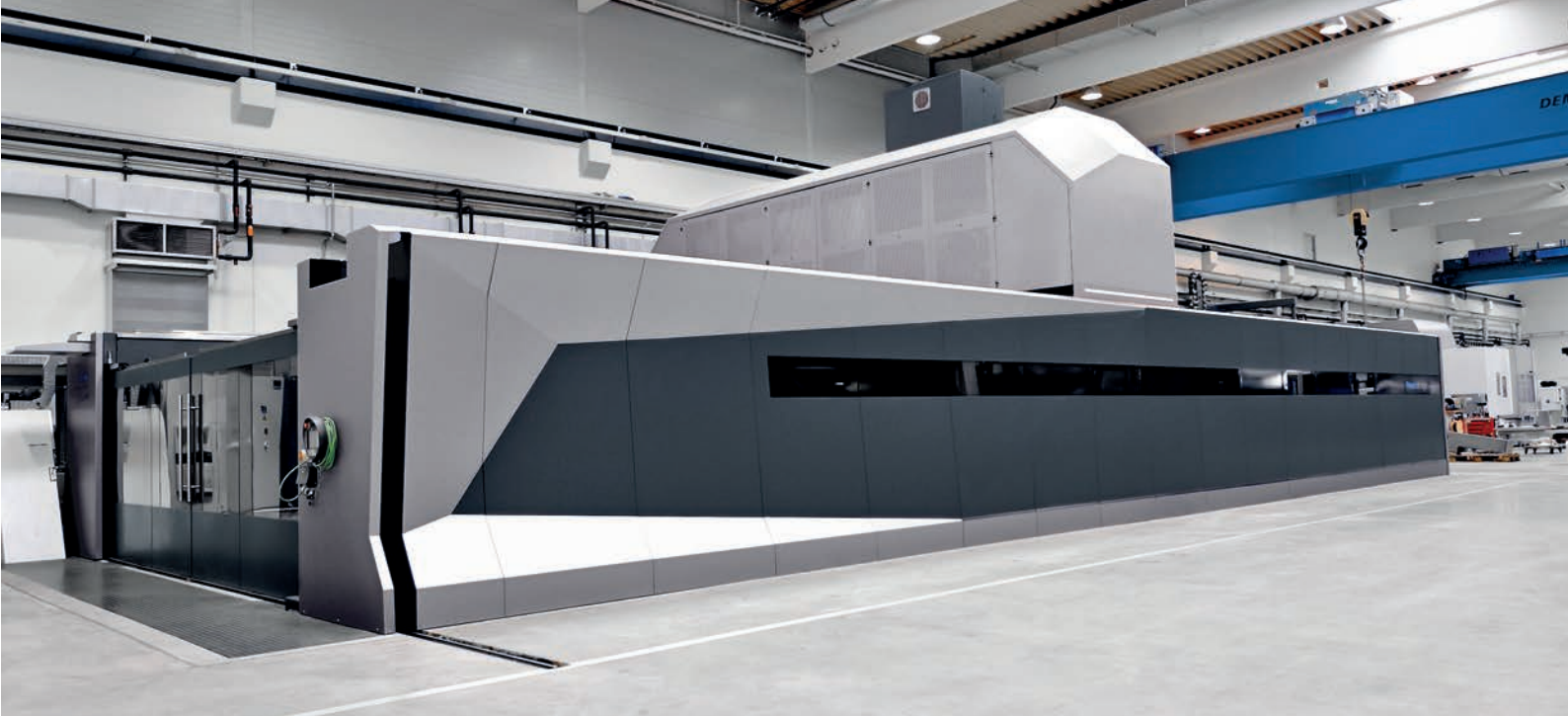
50.000 mm X
5.100 mm Y
1.800 mm Z

The High Gantry Version of the PowerBridge impresses not only by its design, but also with its high cutting performance and dynamics. Due to the side plate construction in polymer concrete, vibrations are eliminated, in addition giving highest rigidity.

shw-wm.de



Powerful. Dynamic. Accurate.



Technical Data

Working areas / Travels			Clamping surfaces	freely configurable
X axis (horizontal longitudinal)	mm	up to 50.000		
Y axis (horizontal cross)	mm	up to 5.100		
Z axis (vertical)	mm	up to 1.800		
Orthogonal milling head	A axis	degree(°) 1° indexing infinitely variable	ATC	
	C axis	infinitely variable	Number of pockets	freely configurable Special solutions possible
Main drive/Motor spindle			Tool Taper	SK 50 BIG-PLUS HSK 100 A DIN 69893
Drive power	kW	up to 100/70	Option	
Speed range	rpm	up to 6.000/24.000		
Feeds and rapid traverses			CNC-system	Siemens 840D sl Heidenhain TNC 640
X axis	mm/min	0-36.000		
Y,Z axis	mm/min	0-30.000		
Acceleration of the linear axis	m/s ²	2		
Machine weight		depending on travels		

Your Benefits



Head change

The use of different milling heads enables a wide range of processing tasks



Turning and milling

Equipped with a turning table, the PowerBridge becomes a "Multitool", combining turning and milling operations in one set-up



Operator Platform

The travelling platform permits any time an optimum view of the machining operations, without interference of the working area



Design

The "Sharp Edge Design" underlines the characteristics of the PowerBridge: Power and Dynamics



ATC

The travelling tool robot transports the tools - parallel to the machining time - to the transfer station. Due to the position of the tool magazine there are no interfering contours.



Shuttle machining

An optional dividing wall enables shuttle machining operation with the result of a considerable reduction of unproductive times.

Equipment features

Mill
and
Turn

Energy
Efficient

Remote
Diagnosis

Milling Head
Measure-
ment

Hybrid
Construc-
tion

Camera

Head
compensa-
tion

clamping
System

Option

- Second machine bridge
- Fork head with motor spindle
- Splash guard cover
- Travelling operator platform



Accuracies

Axes X, Y, Z

Positional uncertainty

Positional scatter

Positional deviation

Reversal error

$P = 15 \mu\text{m} + 2 \mu\text{m}$ per each meter of travel

$P_s = 7,5 \mu\text{m} + 1 \mu\text{m}$ per each meter of travel

$P_a = 0,2 \mu\text{m} \times \sqrt{L_{\text{max}}}$ [L_{max} in mm]

$U = 5 \mu\text{m}$

Milling heads



Universal milling head

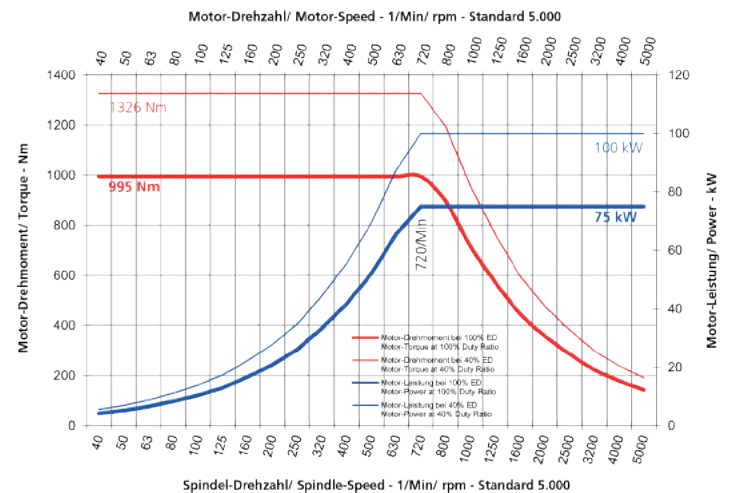
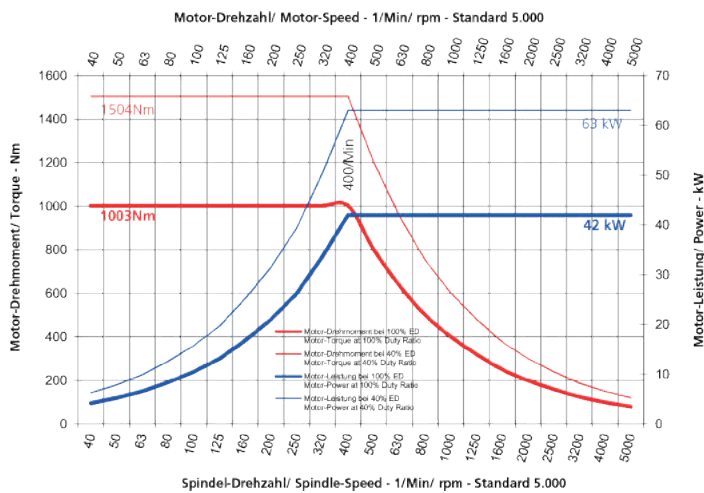


Fork milling head



Special milling heads

Performance Diagram



Versions

- Milling machine
- Turning-milling machine
- Head change machine

Uni
Scan

Interpolation
Turning

Non
Circular
Turning

Gear
Wheel
Milling

Remote
Desktop



Milling Heads

Universal Milling heads // Fork milling heads
Horizontal milling heads // Angular milling heads
Special milling heads

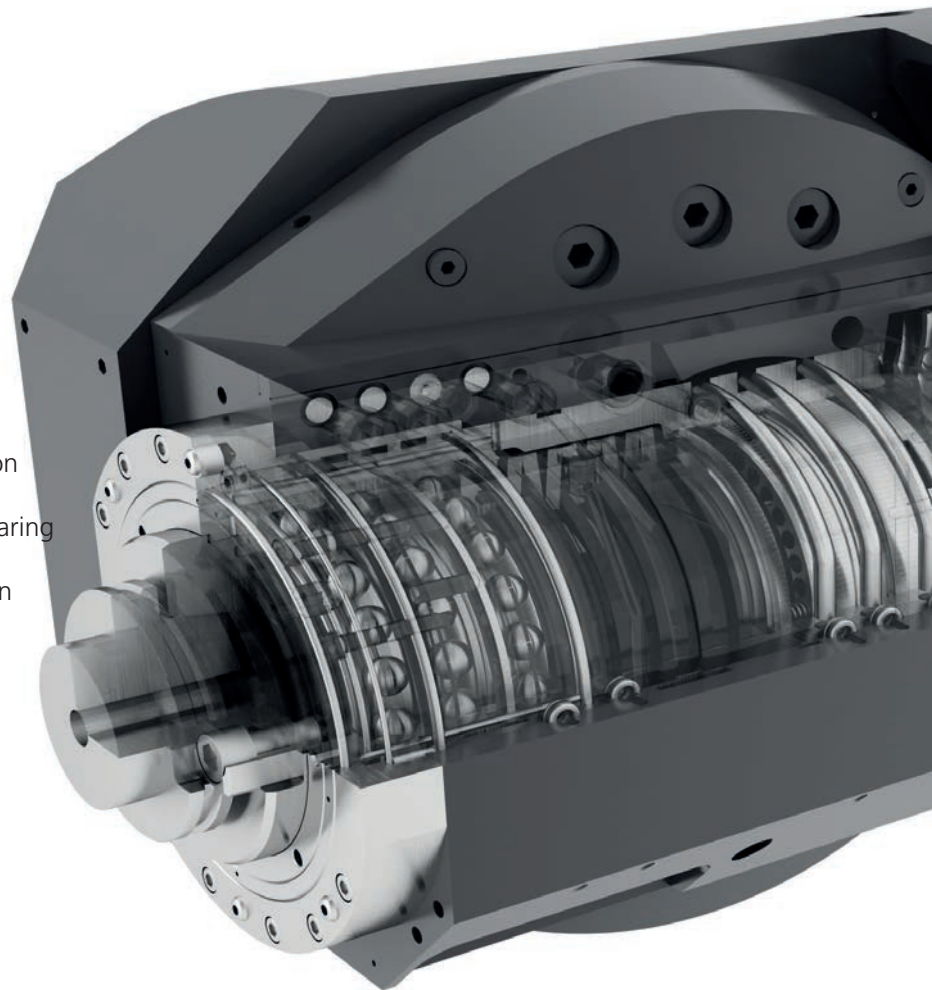


Milling head clamping

- Form and force-fit connection by means of face gear rings
- A axis – swivel range up to 200°
- C axis 360°
- A axis does not move out during rotation. Owing to the compact design, chips cannot enter the milling head.
- Standard execution: already 64800 positions can be reached

Lubrication

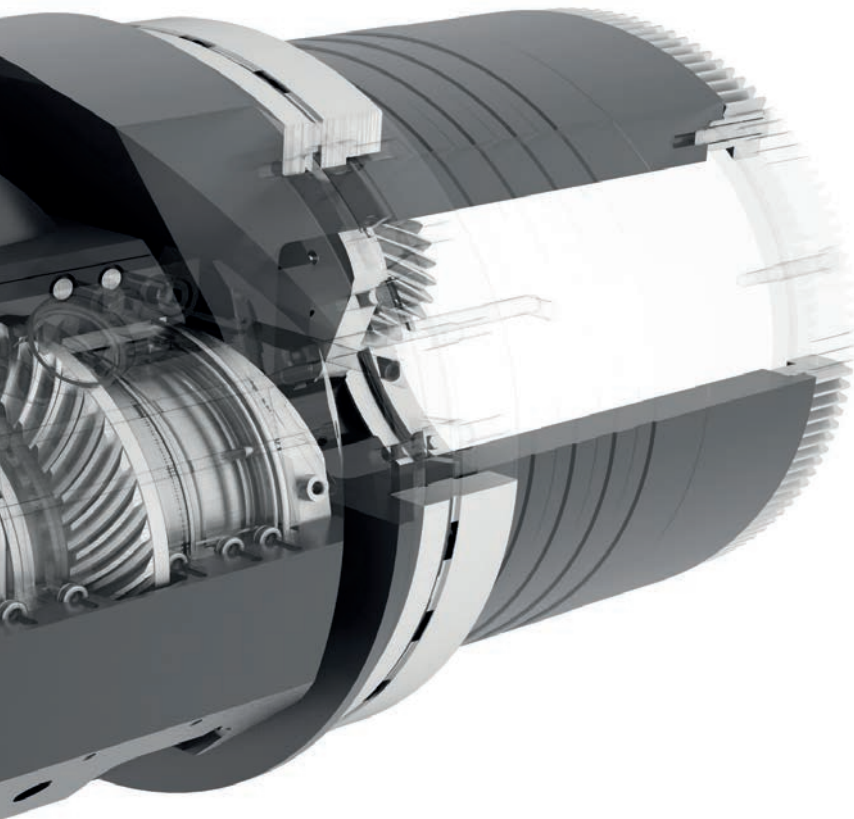
- Permanent grease lubrication of the spindle bearings, protected by sealing air
- A axis: Radial/axial bearings with oil-air lubrication
- C axis: needle bearing with oil-air lubrication
- Cylindrical roller bearing and angular contact bearing with oil-air lubrication
- Spur gears and bevel gears with oil-air lubrication



Cooling system of milling head

- Temperature stability in all speed ranges consequently high geometrical stability
- All bearing positions of the powertrain are connected to the cooling circuit

This head embodies many clever ideas, Know-How and years of experience



Use

- UniSpeed 2000 / 3000 / 6000
- PowerSpeed 2000 / 4000

Construction principles

- Compact design, avoiding external cables and hoses
- No external interference contours
- Plasma coated bevel gears, granting high wear resistance
- Highest possible diameter of the face gear, consequently a high degree of rigidity
- Direct main spindle drive, transmission ratio 1:1
- Balanced rotating parts for high operating smoothness Option 8.000 rpm: hybrid spindle bearing (bearing with ceramic balls)
- During tool ejection no axial load on the spindle bearing for increase of service life
- Maintenance-friendly semi-shell construction for fast spindle change
- Spindle with flexible interface for additional units (i. e. angular milling head, spindle extension, turning steel holder)
- Optionally available with long spindle nose and thus no need for long tools, high rigidity due to additional spindle bearing

Tool cooling

- Media: Cooling lubricant, air, minimum lubrication
- External cooling: ball jets within the spray ring
- Internal cooling: centrally through the milling spindle
- Pressure: standard 20 bar, option 40 and 70 bar

Milling Head Program

Universal milling heads



- Orthogonal / diagonal milling head
- Drive power up to 100 kW
- Spindle speeds up to 8.000 rpm
- Torque up to 2300 Nm
- Division: 1° / infinitely variable

Fork milling heads



- Eccentric / Centric fork milling head
- Drive power up to 70 kW
- Spindle speeds up to 24.000 rpm
- Torque up to 445 Nm
- Division: infinitely variable

Horizontal milling heads



- Eccentric horizontal milling head
- Drive power up to 100 kW
- Spindle speeds up to 5.000 rpm
- Torque up to 2.000 Nm
- Division: infinitely variable

Angular milling heads



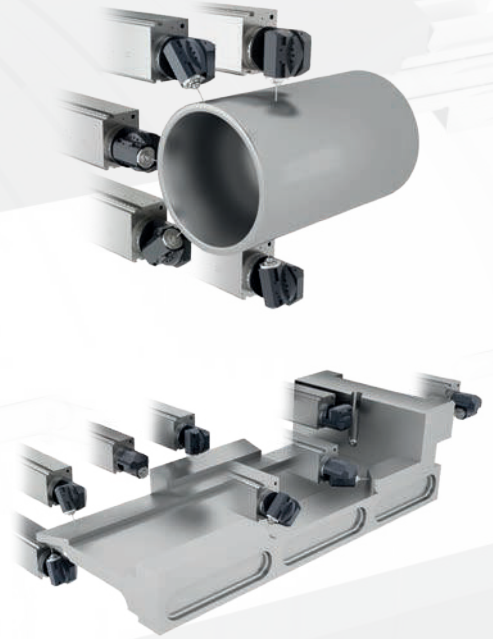
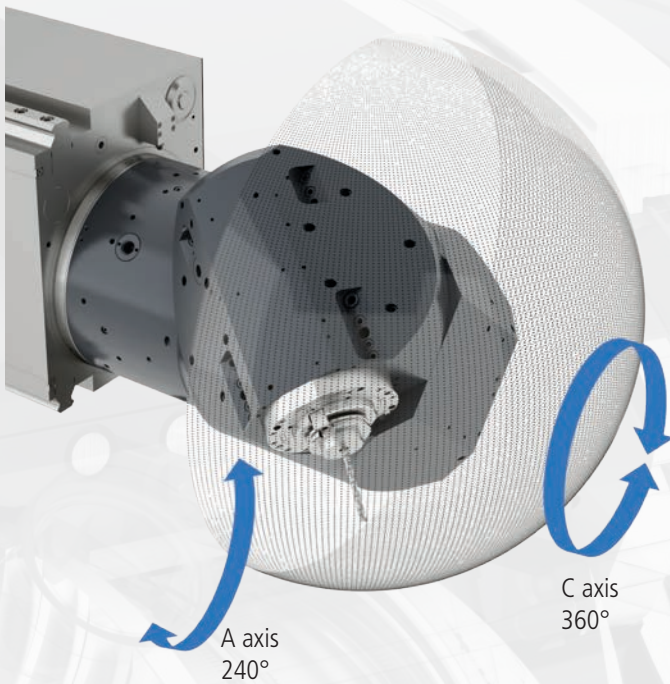
- Drive power up to 100 kW
- Spindle speeds up to 6.000 rpm
- Torque up to 1.300 Nm
- Division: infinitely variable

Special milling heads



- Facing and boring head
- Multi-spindle drilling head
- Horizontal / vertical turning head

Maximum workability and unlimited options -
due to the continuous C and A axes, Possibility
of 5 axes simultaneous machining



Head change system



Individual tasks ask for universal solutions.
Our head change system is the key to the required
flexibility to machine your components.

Numerous milling heads – united in one machine –
multiply the scope for different processing options.

The head interface is a continuous axis – not only a
positioning axis.

Universal milling heads



Use

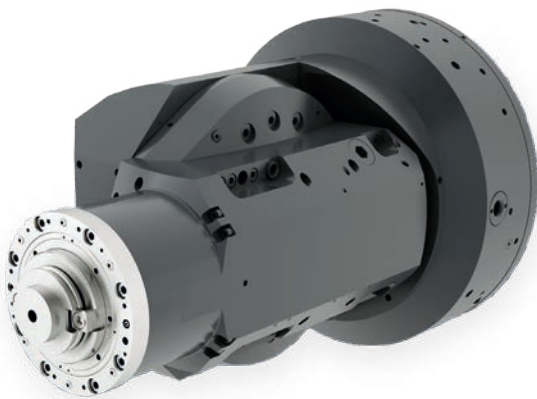
- UniForce 4000 / 7000

Advantages

- 64.800 machining positions as a standard
- Cast housing for milling head and milling head adapter, granting a better absorption of vibrations
- Compact design
- Key and friction locked connection of the A and C axes
- Media supply through the head
- Programmer-friendly
- Liquid cooled
- No requirement for long tools due to the provided extension
- High stability for heavy chip removal

Applications

- Steel construction
- Construction machinery
- Gearbox manufacturing
- Rail machining
- Motor production
- Mechanical engineering
- Case production
- Universal machining



Use

- All machine series in connection with infinitely variable C axis / head change system

Advantages

- Infinitely variable C axis for more than 216.000 machining positions
- Form and force-fit connection in the A axis
1° indexing +90°/-110° (200 possible positions)
- Maintenance-friendly semi-shell construction for a quick spindle change
- Compact design
- Cast housing for milling head and milling head adapter, granting a better absorption of vibrations
- Media supply through the head
- Programmer-friendly
- Liquid cooled
- No requirement for long tools due to the provided extension
- High stability for heavy chip removal

Applications

- Steel construction
- Construction machinery
- Gearbox manufacturing
- Motor production
- Rail machining
- Mold construction
- Mechanical engineering
- Case production
- Universal machining



Use

- All machine series in connection with infinitely variable C axis / head change system

Advantages

- Infinitely variable A and C axis for more than 31 billion machining positions
- Automatic compensation of the swivel axes
- Maintenance-friendly semi-shell construction for a quick spindle change
- Compact design
- Cast housing for milling head and milling head adapter, granting a better absorption of vibrations
- Media supply through the head
- Programmer-friendly
- Liquid cooled
- No requirement for long tools due to the provided extension

Applications

- Gear machining
- Mold making and tooling
- Turbine construction
- Special machine construction
- Energy industry
- Shipbuilding
- Aircraft construction
- Universal machining



Use

- All machine series in connection with infinitely variable C axis / head change system
- PowerSpeed 4000

Advantages

- Form and force-fit connection in the A and C axis
- 129600 machining positions
- Automatic compensation of the swivel axes
- Compact design
- Cast housing for milling head and milling head adapter, granting a better absorption of vibrations
- Liquid cooled

Optionally

- Infinitely variable A and C axis

Applications

- Gear machining
- Mold making and tooling
- Turbine construction
- Special machine construction
- Energy industry
- Shipbuilding
- Aircraft construction
- Universal machining

Fork milling heads



Use

- All machine series in connection with infinitely variable C axis / head change system

Advantages

- Easy access to complex components due to the swivel clearance
- High speeds
- A and C axis rotate continuously
- Media supply through head
- Milling of undercut geometries
- Fewer individual machining operations, thus better surface finish
- Robust design due to two-sided bearings

Applications

- Aluminum machining
- Aircraft construction
- Mold making and tooling
- Milling of special geometries



Use

- UniSpeed 2000 / 3000 / 6000
- PowerSpeed 2000 / 4000
- UniForce and PoweerBridge in connection with infinitely variable C axis / head change system

Advantages

- High speeds
- A and C axis rotate continuously
- Media supply through head
- Milling of undercut geometries
- Fewer individual machining operations, thus better surface finish
- Robust design due to two-sided bearings
- Extremely high accuracy
- High swivel moment

Applications

- Aluminum machining
- Aircraft construction
- Mold making and tooling
- Milling of special geometries
- Gear machining

Eccentric horizontal milling head



Use

- All machine series in connection with infinitely variable C axis / head change system

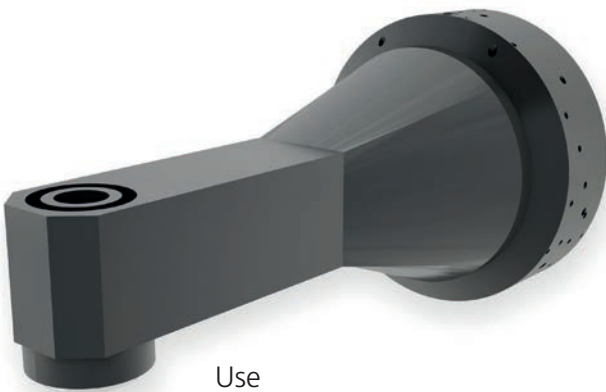
Advantages

- Higher torque is possible
- Suited for high speeds
- Available in different lengths
- Large immersion depth
- High locking torque of C axis by means of hydraulic clamping
- Tangential tracing of the tool by means of the infinitely variable C axis during machining along the workpiece geometry
- Eccentric design often advantageous for machining
- Different diameters available (Ø 130 mm – 210 mm)

Applications

- Steel construction
- Case production
- Machining of surfaces which are deep within the component
- Cast iron machining

Angular milling head



Use

- All machine series in connection with infinitely variable C axis / head change system

Advantages

- Media supply through the head
- Reduction of setting times and the number of required component set-ups
- Contour parallel tracking of the cutter with the infinitely variable C axis along the workpiece geometry during machining
- Infinitely variable C axis
- High locking torque of the C axis

Applications

- Motor production
- Contouring operations
- Machining of positions difficult to reach within a housing



Advantages

- Available with C6, C8 , C10 adaptors
- Rigid tool clamping, granting a high stability
- Machining with long boring bars in vertical position
- High clamping torque in the C axis, granting efficient machining

Applications

- Turning of cast iron parts
- Turning of steel components

Use

- All machine series in connection with infinitely variable C axis / head change system



Advantages

- Internal and external machining of bores
- Cylindrical processing
- Machining of tapers
- Concave and convex roundness, machining

Applications

- Steel construction
- Cast iron construction
- Gearbox production
- Facing operations

Use

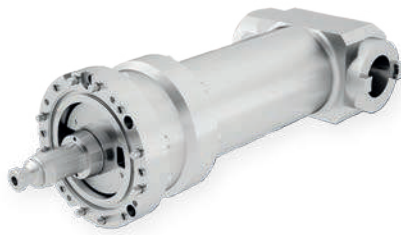
- All machine series in connection with infinitely variable C axis / head change system

Optional Accessories



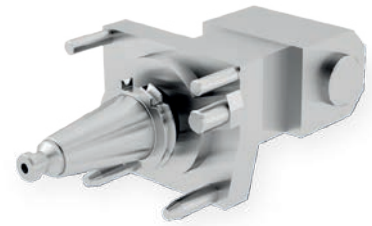
Spindle extension (screwed on)
Support: Crown gear

- Length 300 and 500 mm (special lengths on request)
- External diameter from Ø 130 mm to 210 mm
- Storage in the Pick-Up system
- Internal and external cooling
- Centering in the tool interface of the milling spindle resp. the Hirth serration
- Tool tapers SK 50, BigPlus, HSK 100, Capto 10
- No special pull-studs required
- HSK and Capto with external hydraulic supply or manual tool clamping
- Tool call either from Pick-Up or manual tool change



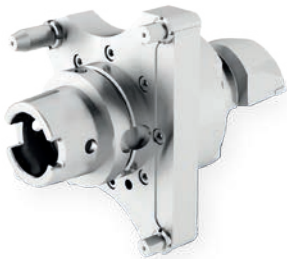
Angular milling head
Support: Crown gear
If necessary: screwed-on

- Various sizes on request
- Storage in the Pick-Up system
- Internal and external cooling on request
- Centering in the tool interface of the milling spindle resp. the Hirth serration
- Tool interface as per customers request
- Tool supply and clamping manual
- Torques up to 500 Nm on request



Angular milling head
3- or 4- point support

- Various sizes on request
- Supply via the ATC
- Data for the tool change: max. 25 kg / 40 Nm tilting moment
- Clamping via the tool clamping of the milling spindle
- Torque support
- Supply KSS via internal coolant
- Tool interface as per customers request
- Tool supply and clamping manual



Turning tool holder
3 or 4-point-support

- Supply via the ATC
- Data for the tool change: max. 25 kg / 40 Nm tilting moment
- Clamping via the tool clamping of the milling spindle
- Torque support
- Coolant supply via internal coolant installation
- Tool interface Capto C6 (others on request)
- Manual tool clamping in the holder
- Support via the milling head housing



Turning tool holder
Support: Hirth serration

- Various sizes on request
- Storage in the Pick-Up system
- Clamping via the tool clamping of the milling spindle
- Optional screw fixing
- Torque transmission via the Hirth coupling
- Supply KSS via internal coolant
- Tool interface as per customers request
- Manual tool clamping in the holder
- Support via the milling head housing



Technology // Equipment features



Equipment features // Technologies

Mill
and
Turn

Available for milling and turning operations

Duo
Drive

Electromechanical adjustment via two independent recirculating ball screws, granting the plane-parallel extension of the headstock

without
foundation

No step (conventional) foundation required

Hybrid
Construc-
tion

Headstock slide and headstock in GGG 60 (cast iron), bed and column in welded construction

Floor
Level

Installation on floor level

Camera

For an extended process monitoring available with camera

Energy
Efficient

Standby mode for aggregates
No hydrostatics
Intermittent duty of the hydraulic pack with buffer storage

Head
compensa-
tion

Milling head compensation

Remote
Diagnosis

Remote diagnosis / maintenance

Tight
Block

Distortion-free welded construction for installation on floor level with integrated coolant and media management

Milling Head
Measure-
ment

Milling Head Measurement

clamping
System

Clamping system

Equipment features // Technologies

Uni
Scan

Collision and overload protection
with machine diagnostics

Interpolation
Turning

Machining of contours by means of
machine-axes interpolation

Non
Circular
Turning

Possibility to execute different
non-circular turning operations

Gear
Wheel
Milling

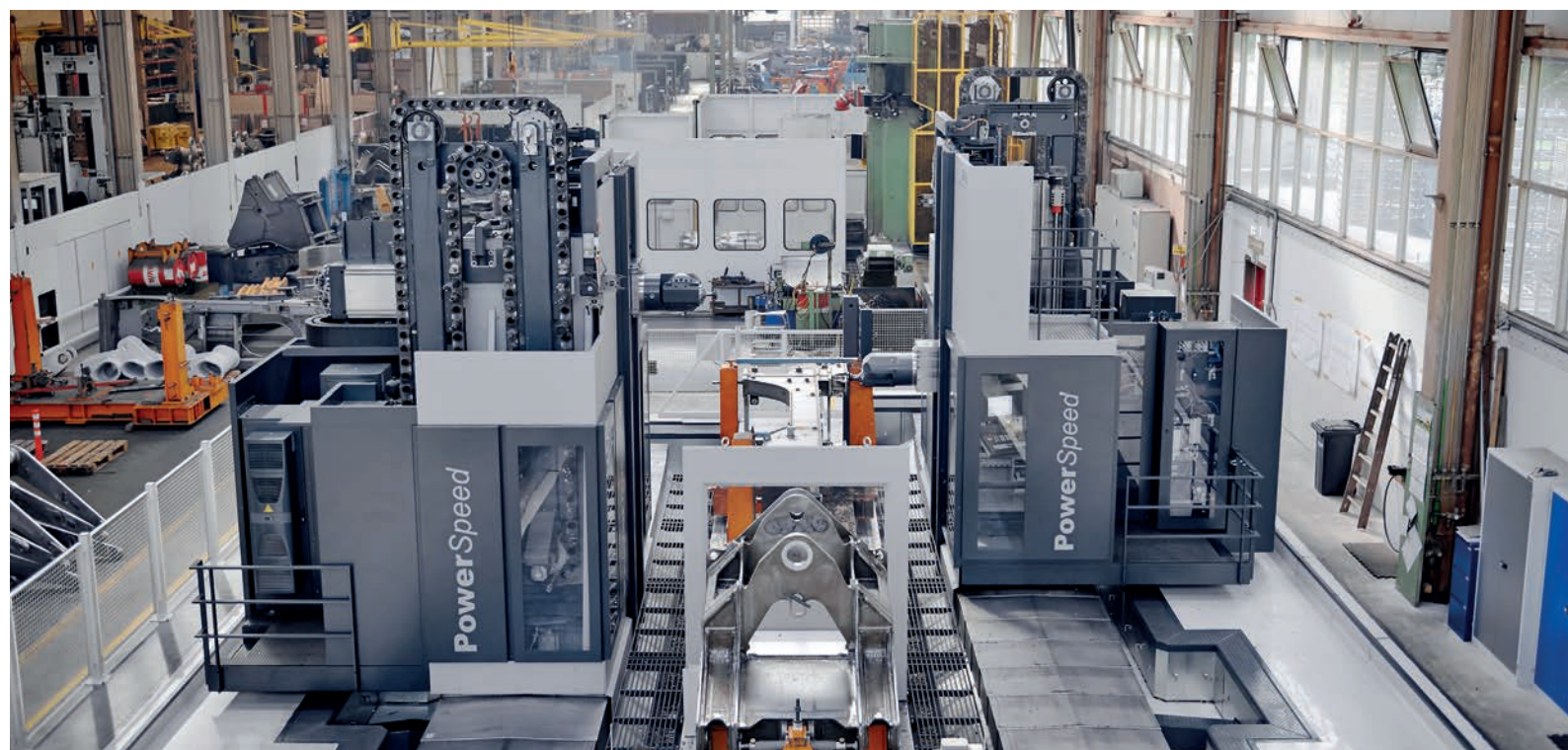
Suited for gear wheel milling

Remote
Desktop

Access to any network integrated PC
via the machine control

We would be happy to explain any further
equipment features and technologies
during a personal discussion











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