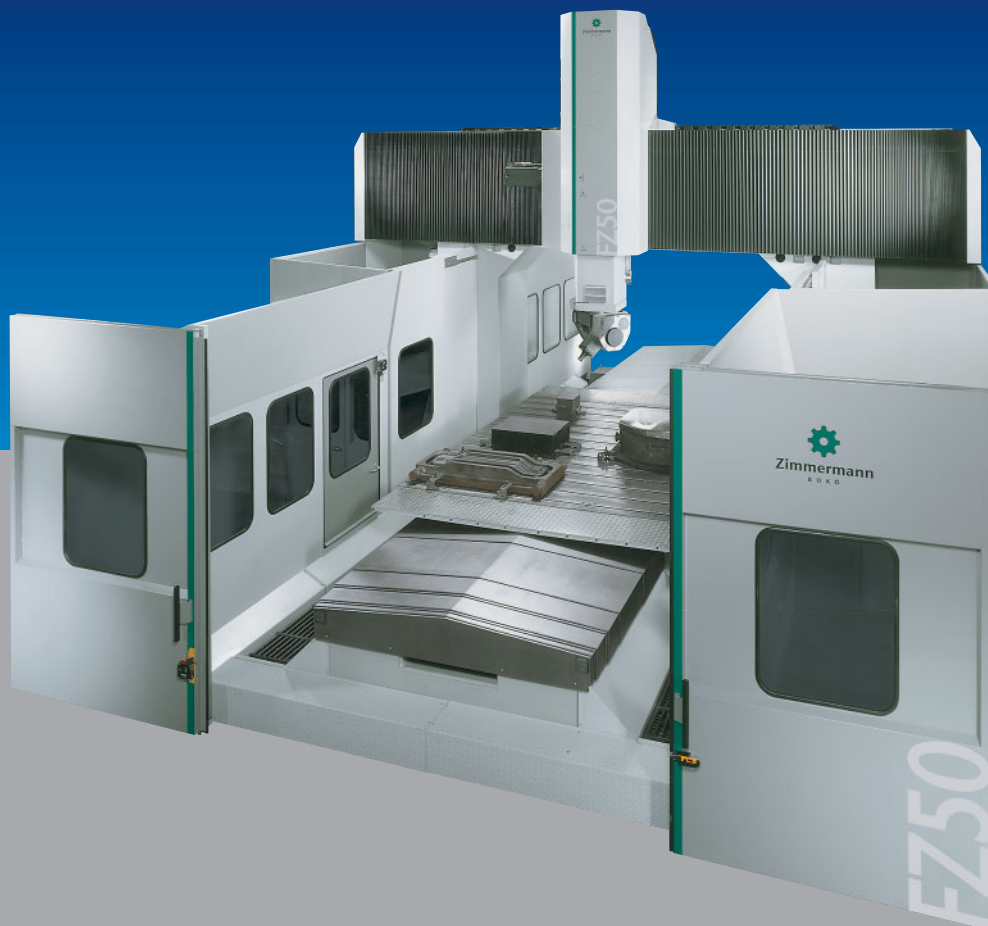




Zimmermann
B O K Ö

CNC Portal Milling Machine

FZ 50



CNC Power Milling
Technology

FZ 50

Portal Milling Machine for Heavy Cutting

The newly developed portal milling machine FZ 50 is based on a flexible machine design which can be used for all existing applications and requirements for the machining of large work-pieces.

By its high rigidity, stiffness and chip removing capacity the FZ 50 is the optimal solution for the heavy machining of all materials including tool steel and titanium.

The large experience of Zimmermann-Bokö in heavy cutting in connection with a wide range of optional designs and milling head systems satisfies the most ambitious demands.

The design of the FZ 50 optimised by FEM simulations is the reason for the extremely high stiffness and rigidity of the machine combined with highest dynamics for 5-sided machining.

In general, the new FZ 50 machine series stands for its modular and ergonomical design. Special attention was set onto optimal accessibility to the working area. This machine series is marking a new dimension of the milling machine technology for Zimmermann-Bokö.

Design

The portal design with a fixed portal and moving table in X-direction enables highest chip removing capacity with a large overhead passage connected with maximum stiffness.

Parking position of the Z-ram for the spindle and the tool change system on both sides.

Telescopic steel covering.

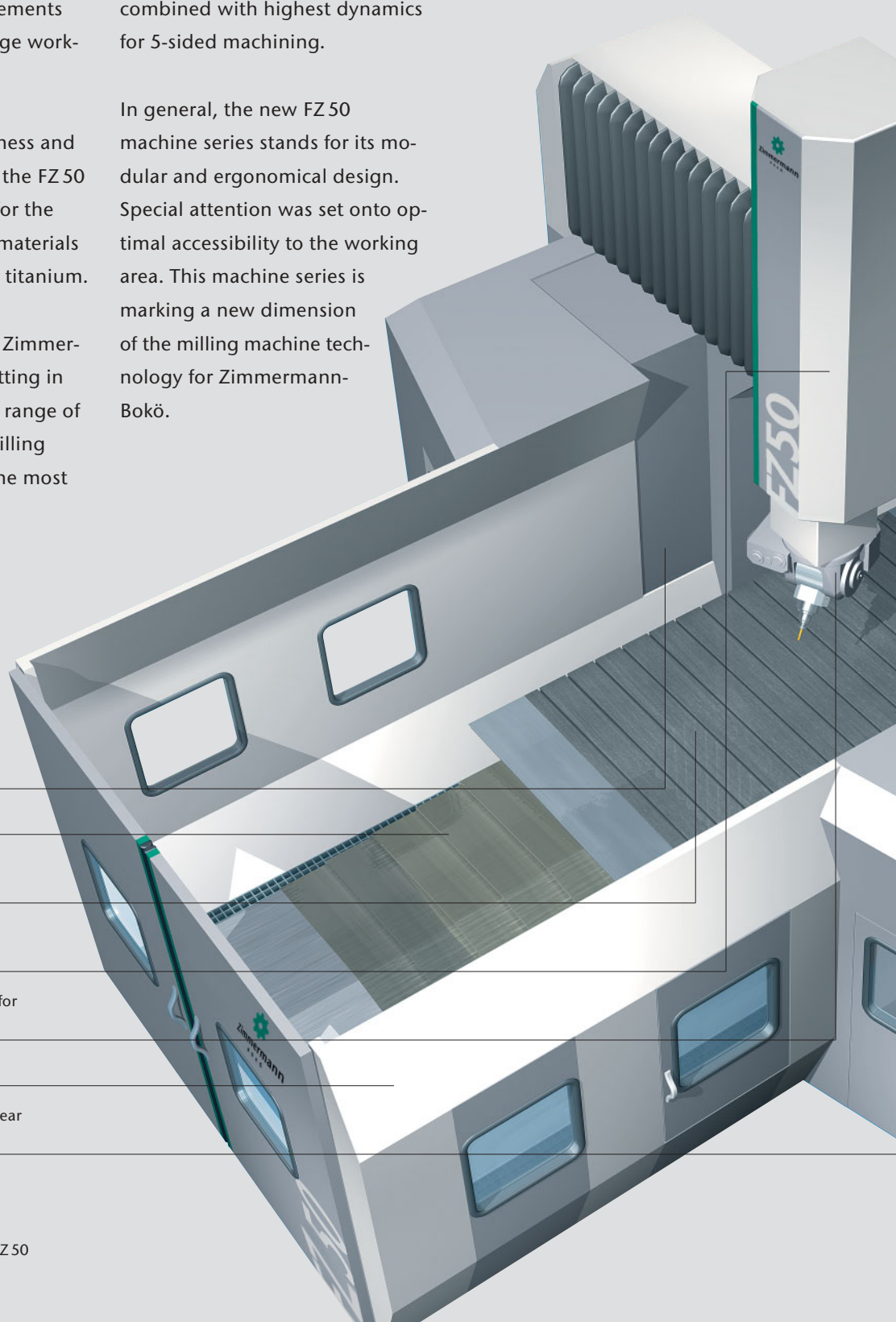
Motor driven work table for high loads.

Vertical ram with generously dimensioned working ranges.

Various milling head variants for different applications.

Integrated safety guarding.

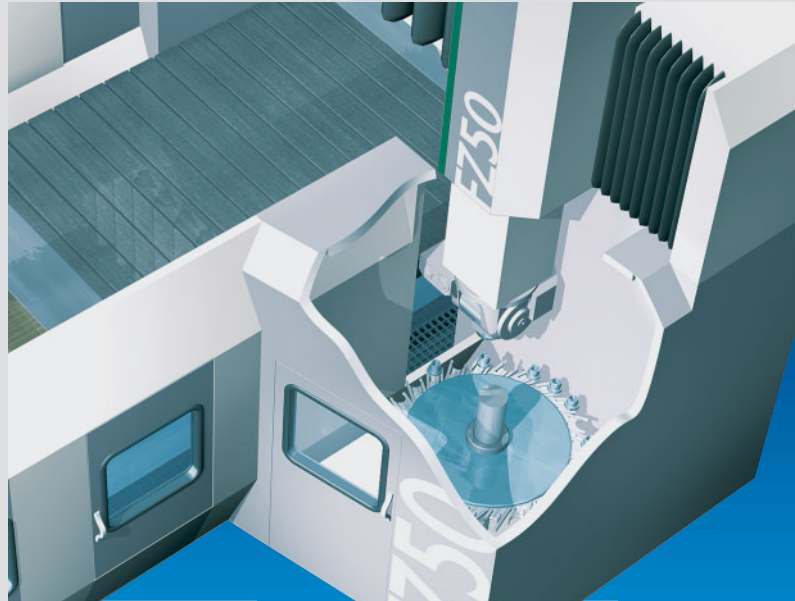
Extremely stiff portal with a clear width of 3900 mm.



The design enables to remove the Z-ram completely out of the working area. Therefore options like tool or spindle exchange could be realised reliably.

Simultaneous Milling

The FZ 50 is designed for 5-axis simultaneous cutting. In connection with the NC rotary table up to 6 simultaneous axes are available.



▲ FZ 50 with its Z-ram in parking position. The tool change system enables an automatic tool change outside of the working area.

Housing

The integrated housing of the machine allows both dry and wet cutting.

Machine Construction

Clamping table, columns, bridge and Z-ram are made of cast iron.

As an option the Z-ram is made of cast iron or welded steel depending on the milling head used.

Drive System

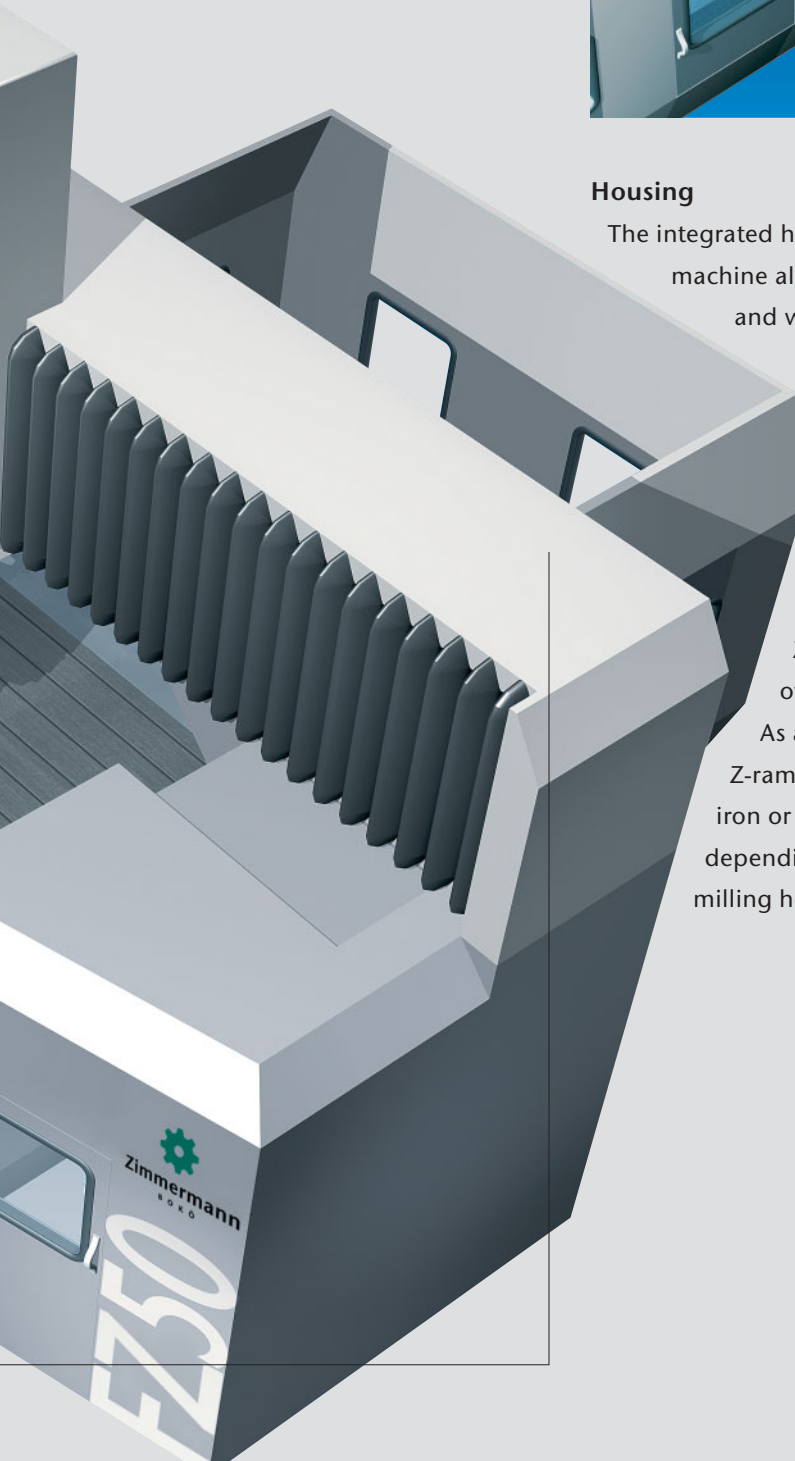
Independent of the supplier of the control system, all axes are equipped with Siemens "Simodrive" digital drives. All linear axes (X, Y and Z-axes) have pre-tensioned linear roller bearings. All ball screws are equipped with pre-loaded nuts and counter-nuts.

Measuring Systems

The three linear axes, X, Y and Z are equipped with direct length measuring systems with Heidenhain glass scales. There is a compressed air barrier supply to protect the measuring systems against dirt and dust.

Controls

The open design of the FZ 50 allows to equip the machine with various makes and types of control system.



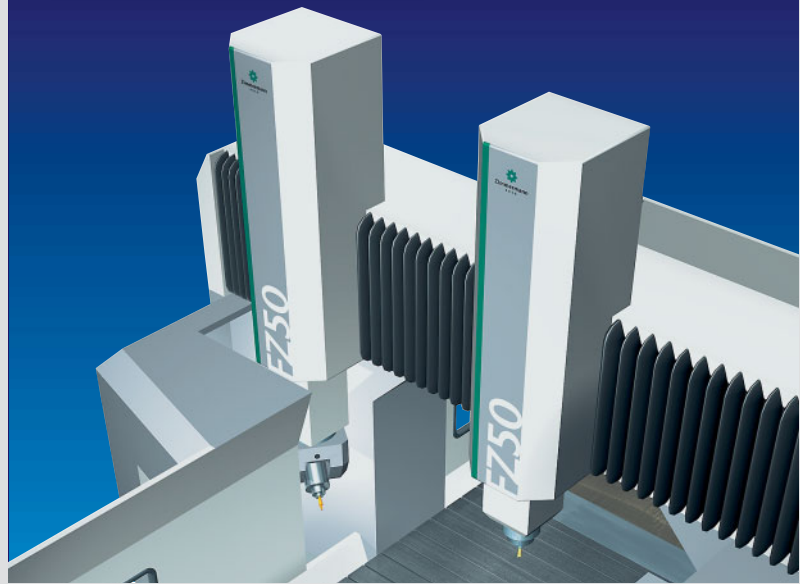
FZ 50 Duo

The Duo Design

Besides its standard design, the FZ 50 machine can be delivered with a totally independent second Z-ram. The Z-rams on both sides can entirely be driven out of the working range and thus enable a reliable variation between roughing and finishing in an unmanned operating mode. The FZ 50 Duo needs no costly milling head interchanges, through what highest productivity and maximum process safety is reached.

Advantages of the Duo Design

The Duo design offers considerable advantages in order to configure the optimal machine design for every purpose:



- The combination of two milling heads enables a maximum application range.
- Separate Z-rams and heads enable highest finishing accuracy on a long term.
- Increase of productivity is obtained through parallel machining of identical or mirror-inverted parts.
- Process-secure alternative to head exchange systems.

Examples of Duo Combinations

(Milling heads see page 6 and 7)

- Fork head VH 4 – fork head AC 3 or fork head VH 6: 5-axis roughing and finishing
- Vertical milling head – fork head AC 3 (see figure) or fork head VH 6: 3-axis roughing and 5-axis finishing.
- Two fork heads AC 3 or two fork heads VH 6: Ideal variant for simultaneous 5-axis machining of two large structural parts (aircraft industry).

FZ50 Milling Units

The flexible FZ 50 machine design provides the application of different milling units (see overview on pages 6 and 7).

The standard design enables roughing of all materials and is equipped with the well-proved 2-axis fork head VH 4.

The fork head VH 4 has a swivelling range of $\pm 100^\circ$ in the A-axis which can be clamped hydraulically, in addition.

The bush contact connection in the C-axis permits infinite rotation in both directions. Both axes are designed as fully simultaneous-suitable NC-axes.

High torque together with a low speed allow the power machining and additional complete application such as drilling, threading and countersinking.

The milling head VH 6 is a new development specifically designed for the HSC technology. The drive of the two rotary axes is performed by means of torque motors which are free from backlash. The high driving torque enables the rotary axes to be used as simultaneous or as electronically fixed axes. In addition a hydraulic clamping of both axes is possible. Both axes drives are designed following the Thermosandwichprinzip® and are equipped with a power and a supplementary precision cooling unit.

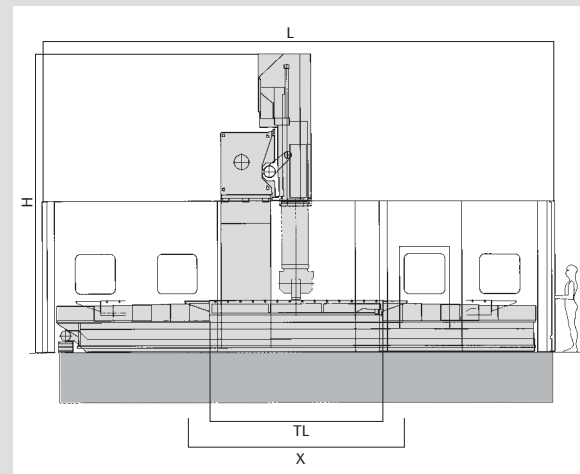
FZ 50

Technical Data

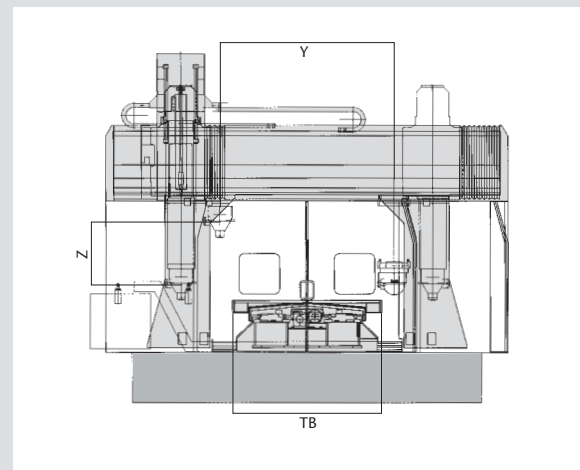
Machine		FZ 50	
Working ranges			
X-axis		2 500 – 5 500 mm	
Y-axis		3 500 mm	
Z-axis		1 250 – 1 500 mm	
Portal clear width		3 900 mm	
Work table			
Length (X-axis)		2 000 – 5 000 mm	
Width (Y-axis)		3 000 mm	
Work table loading (standard)		15 000 kg	
Drive of linear axes			
Feed		0 – 20 000 mm/min.	
Acceleration		max. 2,5 m/s ²	
Accuracy		Axis	as per VDI / DGQ 3441
Positioning accuracy	X, Y, Z		P = 0,02 mm
Repeatability	X, Y, Z		Ps = 0,01 mm
Positioning accuracy	A, C		P = 10" = 0,00277°
Repeatability	A, C		Ps = 8" = 0,00222°
Rotary table (option)		FZ 50	
Work table loading		8 000 kg	
Holding torque clamped		40 000 Nm	
Torque in simultaneous operation		25 000 Nm	
Feed		0 – 6 min ⁻¹	
Options		FZ 50	
Tool changer		16 – 48 Disc magazine 50 – 120 Chain magazine	
Palette changer		as per customer specification	
Double ram design		2 separate Z-rams working independently	
Chip conveyer		longitudinal and/or transversal	
Dimensions		Min.	Max.
X	Working range X-Axis	2 500 mm	6 500 mm
Y	Working range Y-Axis	3 500 mm	3 500 mm
Z	Working range Z-Axis	1 250 mm	1 500 mm
L	Total length of machine	9 500 mm	18 000 mm
B	Total width of machine	8 000 mm	8 000 mm
H	Total height of machine	6 000 mm	6 500 mm
TL	Length of table	2 000 mm	6 000 mm
TB	Width of table	3 000 mm	3 000 mm

All dimensions given are the maximum and minimum examples of the FZ 50 machine. Other dimensions on demand.

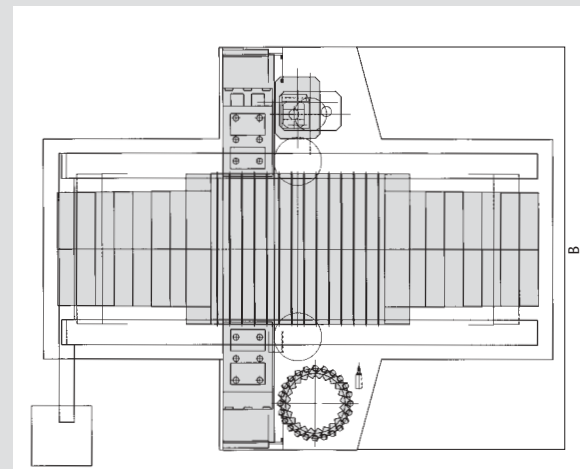
Subject to technical changes.



FZ 50 from the left.



FZ 50 from the front.



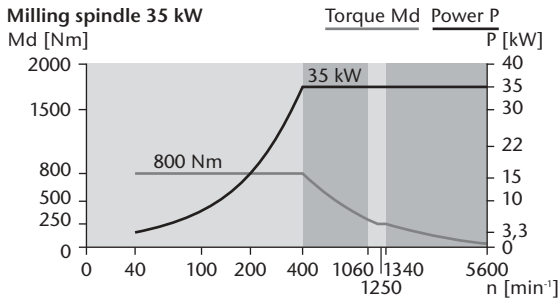
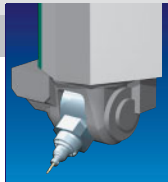
Plan view of the FZ 50.

FZ 50

Milling Heads

2-axis fork head VH 4

With step wheel gears, automatic gear changing.
 Axes drives:
 ■ A-axis and C-axis NC



Technical data

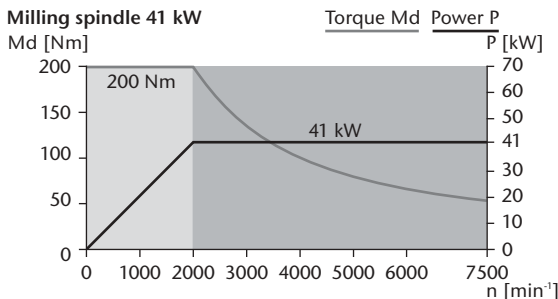
Spindle power max. (S6 / 60 % ED)
 Spindle speed max.
 Torque max. (S6 / 60 % ED)
 Constant power range

35 kW
 5 600 min⁻¹
 800 Nm
 400 –
 5 600 min⁻¹
 25°/s
 7 000 Nm
 > 20 000 Nm
 SK 50
 spring
 hydraulic
 270 mm

Rotation A- and C-axis
 Torque in simultaneous operation
 Holding torque clamped
 Tool holder
 Tool clamping
 Tool unclamping
 Distance swivel axis to spindle nose

2-axis fork head VH 6

With roughing spindle.
 Axes drives:
 ■ A-axis and C-axis
 Torque motor



Technical data

Spindle power max.
 Spindle speed max.
 Torque max.
 Constant power range

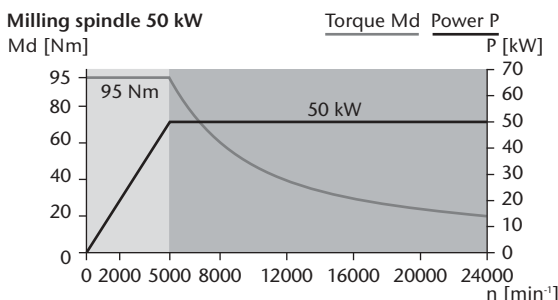
41 kW
 7 500 min⁻¹
 200 Nm
 2 000 –
 7 500 min⁻¹

Torque A- and C-axis in simultaneous operation
 Torque A- and C-axis clamped
 Swivel range A-axis
 Swivel range C-axis
 Tool holder
 Tool clamping
 Tool unclamping
 Distance swivel axis to spindle nose

1 350 Nm
 3 000 Nm
 ± 95°
 ± 360°, opt. ∞
 HSK 100 A
 spring
 hydraulic
 400 mm

2-axis fork head VH 6

With universal spindle.
 Axes drives:
 ■ A-axis and C-axis
 Torque motor



Technical data

Spindle power max.
 Spindle speed max.
 Torque max.
 Constant power range

50 kW
 24 000 min⁻¹
 95 Nm
 5 000 –
 24 000 min⁻¹

Torque A- and C-axis in simultaneous operation
 Torque A- and C-axis clamped
 Swivel range A-axis
 Swivel range C-axis
 Tool holder
 Tool clamping
 Tool unclamping
 Distance swivel axis to spindle nose

1 350 Nm
 3 000 Nm
 ± 95°
 ± 360°, opt. ∞
 HSK 63 A
 spring
 hydraulic
 300 mm

2-axis fork head AC 3

With motor spindle.
 Axes drives:
 ■ A-axis and C-axis NC

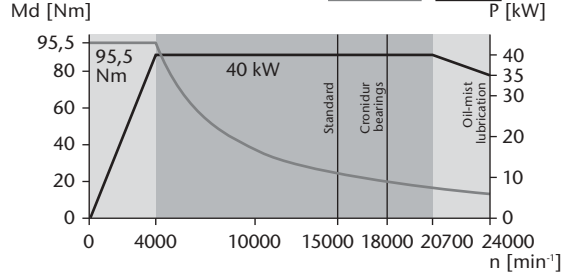


Technical data

Spindle power max. (S1 / 100% ED) 40 kW
 Spindle speed max. 24 000 min⁻¹
 Torque max. (S1 / 100% ED) 95,5 Nm
 Constant power range 4 000 – 20 700 min⁻¹
 50°/s

40 kW
 24 000 min⁻¹
 95,5 Nm
 4 000 – 20 700 min⁻¹
 50°/s

Milling spindle 40 kW



Rotation A- and C-axis
 Torque A- and C-axis in simultaneous operation
 Holding torque in control
 Tool holder
 Tool clamping
 Tool unclamping
 Distance swivel axis to spindle nose
 Digital spindle with orientation

1 500 Nm
 1 500 Nm
 HSK 63 A
 spring hydraulic
 300 mm

Vertical milling head

With step wheel gears,
 automatic gear changing.

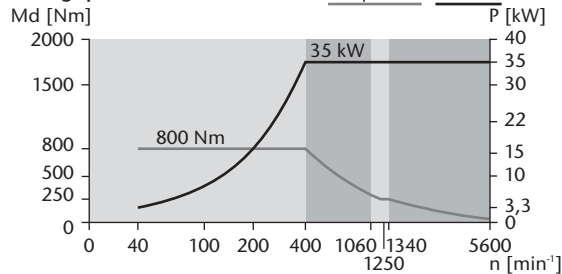


Technical data

Spindle power max. (S6 / 60% ED) 35 kW
 Spindle speed max. 5 600 min⁻¹
 Torque max. (S6 / 60% ED) 800 Nm
 Constant power range 400 – 5 600 min⁻¹

35 kW
 5 600 min⁻¹
 800 Nm
 400 – 5 600 min⁻¹
 SK 50
 spring hydraulic

Milling spindle 35 kW



Tool holder
 Tool clamping
 Tool unclamping

Vertical milling head

With motor spindle.

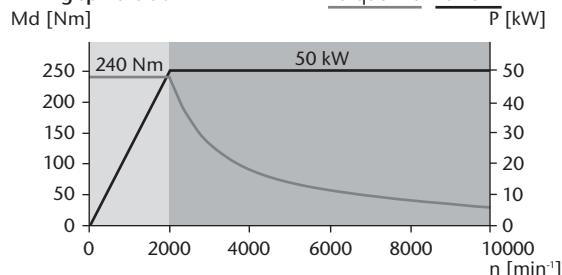


Technical data

Spindle power max. (S1 / 100% ED) 50 kW
 Spindle speed max. 10 000 min⁻¹
 Torque max. (S1 / 100% ED) 240 Nm
 Constant power range > 2 000 min⁻¹

50 kW
 10 000 min⁻¹
 240 Nm
 > 2 000 min⁻¹
 HSK 100 A
 spring hydraulic

Milling spindle 50 kW



Tool holder
 Tool clamping
 Tool unclamping

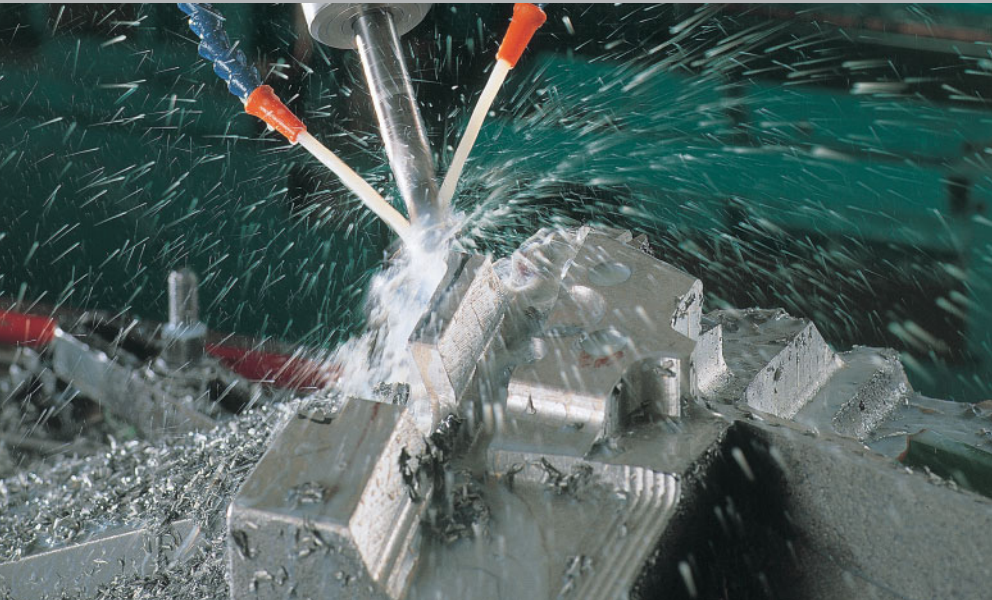
Other milling head and spindles are available on demand.

Subject to technical changes.



High Performance
Milling Technology

Styrofoam
Milling Technology



Zimmermann-Bokö stands for CNC portal milling technique. Specialisation and a high innovation pace lead to the technical head start.

A diversified and finely classified programme of numerous machine types enable the choice of the perfect machine for every targeted application area.



F. Zimmermann GmbH
Goethestraße 23–27
D-73770 Denkendorf, Germany
Phone +49 (7 11) 93 49 35 - 0
Fax +49 (7 11) 93 49 35 - 300
info@f-zimmermann.com
www.f-zimmermann.com

Member of the
DMTG
Dalian Machine Tool Group
38 Anshan Road
Dalian 116022
China
www.dmtg.com