

BA 321



The BA Class.  
Horizontal.



### Horizontal Machining.

There are only a few possibilities to machine steel, cast iron and non-ferrous workpieces. But there are a few allowing to reach an optimum result in view of the given situation. Horizontal, multi-spindle machining on BA class machining centres (MCs) provides a promising way: unhindered chip flow, magazine placed and covered above the machining area and good accessibility for operating and servicing are just some of the reasons to follow this way.

### The BA Class. BA 321

The compact BA 321 centre combines the strong points of the BA class with the compact design of considerably smaller MCs, namely 4-axis machining on a robust machine which can be loaded and unloaded while machining.



Machining Centres For Heavy Machining.



## The BA 321. Perfect Equipment.



The BA Class.  
BA 321

One rotary axis, the compact monobloc design and the possibility to load and unload workpieces in parallel with the machining process were the guidelines under which SW developed the 2-spindle BA 321. The range of applications for this MC machining as a stand-alone machine or in a row is 3- and 4-axis machining of smaller steel, cast iron and light metal parts.

- 2-spindle horizontal machining centre
- Compact monobloc design
- Floating, trunnion-type workpiece carrier for 3- and 4-axis machining
- Tool magazine in a safe position above the work zone
- Central cooling unit ensuring constant temperature of spindles and cabinets
- Integrated hydraulic system for operating clamping fixtures
- Automatic central lubrication system
- Oil mist lubrication of spindle bearings
- Actuators and sensors operating via PROFIBUS
- Plug-type connection of motors and sensors

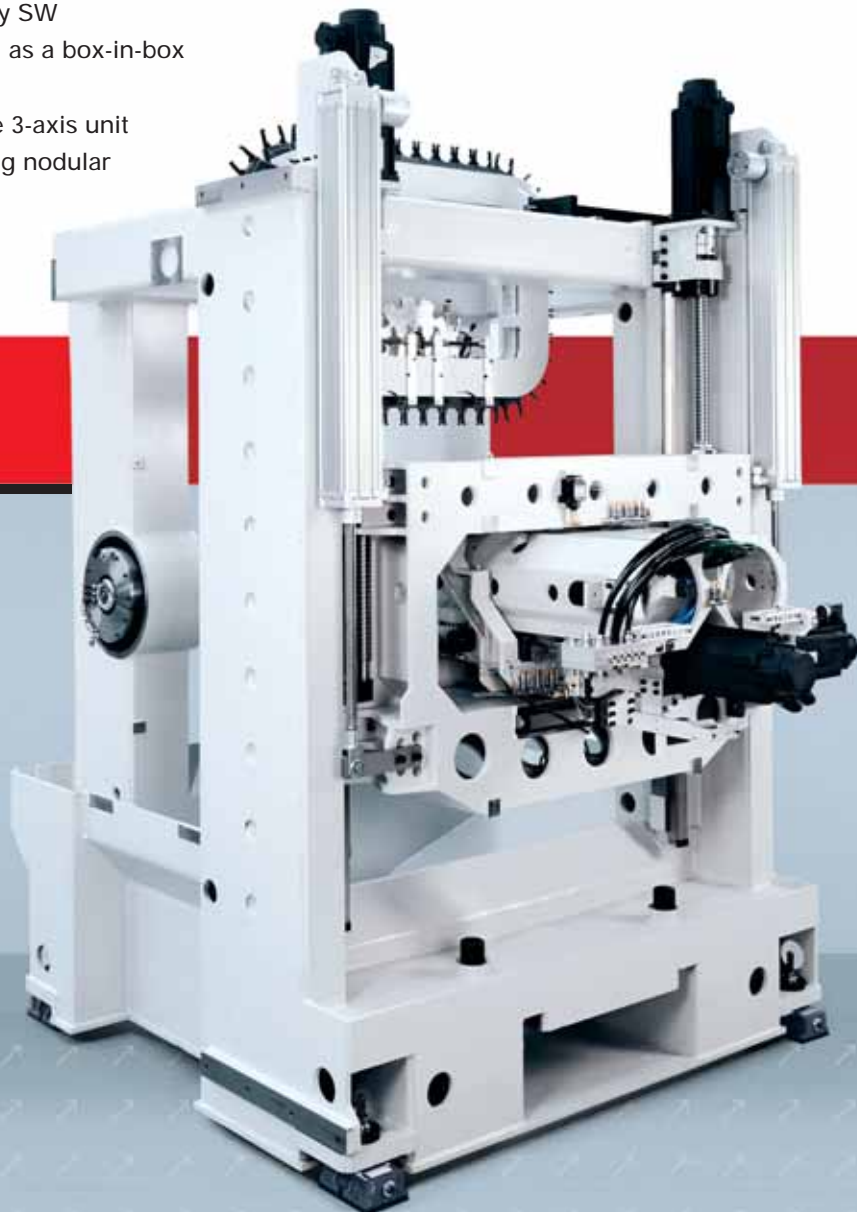


## Frame-type Housing.

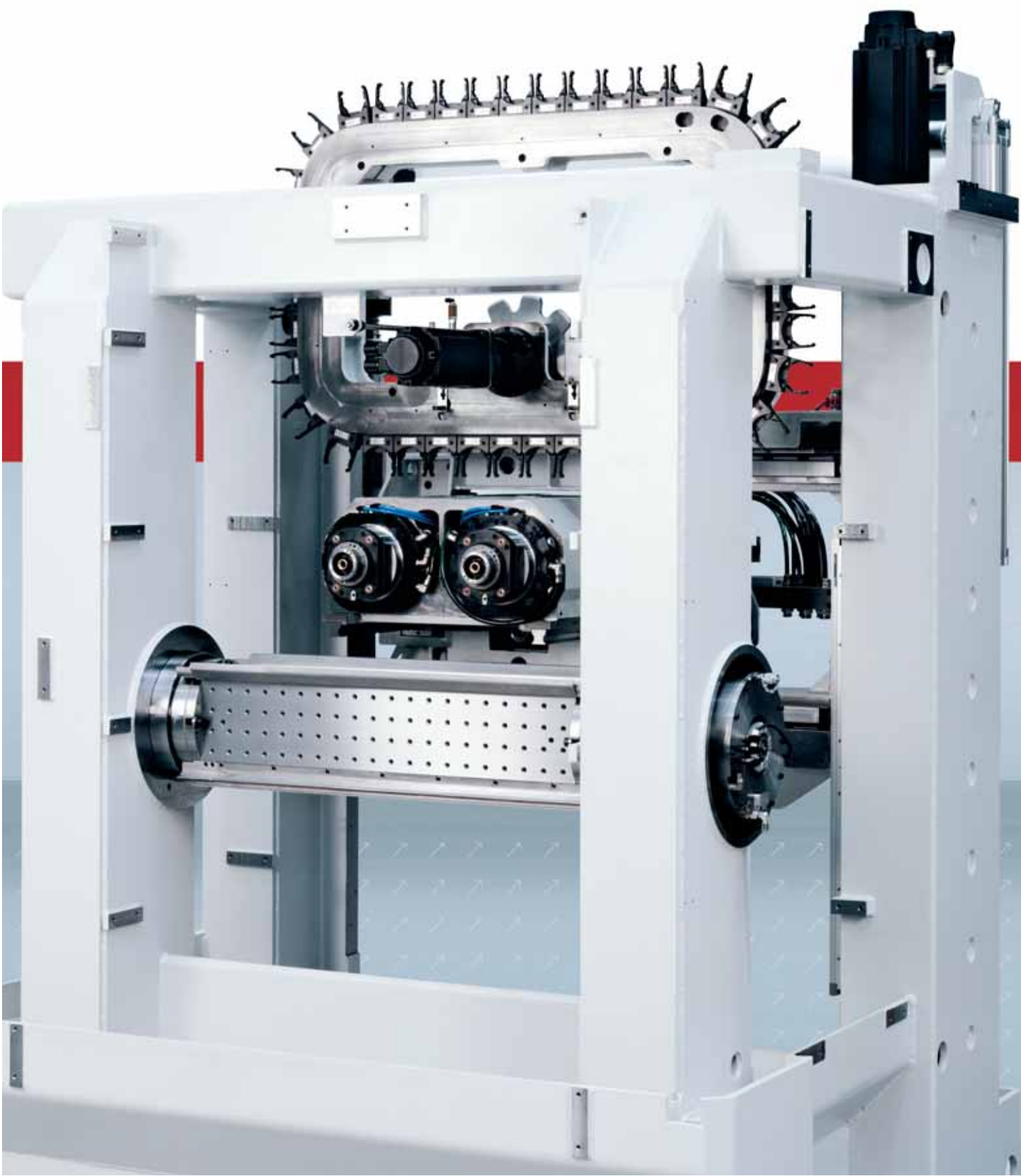
The BA 321 – a „typical SW“: solid design, dynamic axis drives and powerful spindles. The rotary axis does not only allow 4th-axis operations but also indexes the workpiece carrier into the next clamping position.

- Machine structure in monobloc design, patented by SW
- X,Y,Z-Axes moving as a box-in-box housing
- Components of the 3-axis unit made of dampening nodular cast iron

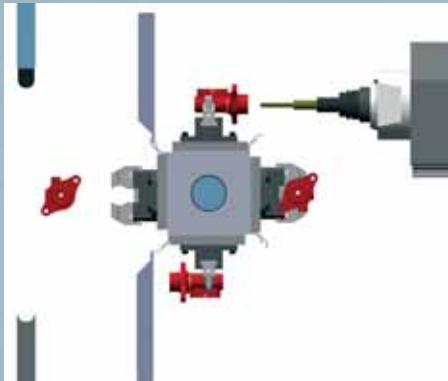
- Ballscrews in the linear axes
- Double drive in the vertical axis for optimum accuracy
- Torque-motor drive in the rotary axis for high speed and accuracy
- Pneumatic counterbalance with automatic buffering



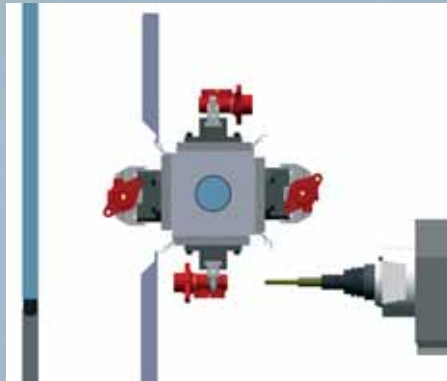
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BA 321



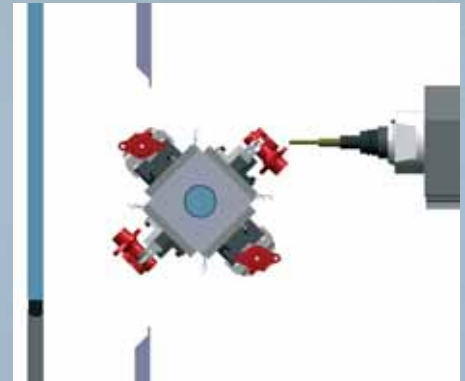
Compact, handy, productive.



Loading



3- axis machining



4- axis machining

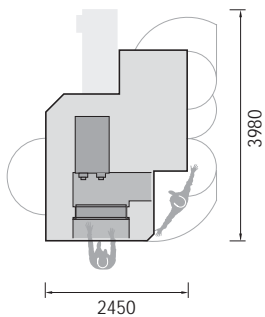
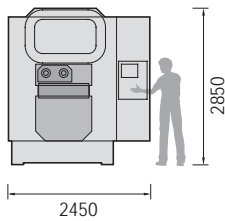
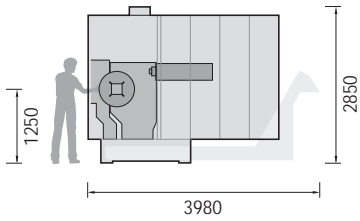
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On the four faces of the square trunnion-shaped workpiece carrier several parts can be clamped. With the 90° positions three trunnion-faces are inside the machining area and one face in the load position. With the partition walls being closed and the loading door being opened workpieces can be loaded in parallel with the machining process. For 4-axis machining the trunnion can be positioned in any angular position.

- Clamping trunnion supported in the hydraulically locked A-axis bearings which can be positioned in any angular position
- Safety locking mechanism in the 90° positions for workpiece loading/unloading in parallel with the machining process
- Automatically operated partition walls separating the loading zone from the machining zone inside the machine
- Up to eight hydraulic lines, air sensing system and air barrier for each trunnion face
- Various clamping configurations:
  - Clamping of multiple workpieces on each of the four trunnion faces
  - Up to 4 set-ups in one machine
- Easy replacement of clamping trunnion due to removable counter bearing



# Technical Data BA 321.



## ■ Working range

X-axis	300 mm
Y-axis (toolchange position)	500 mm (750 mm)
Z-axis	375 mm
Spindle distance	300 mm

## ■ Workpiece carrier

Max. workpiece space A-axis	ø 600 mm x 750 mm
Recommended clamping trunnion	180 mm x 180 mm x 850 mm
Drive system	Torque motor
Load capacity	max. 600 kg
Speed range A-axis	1 - 50 rpm
Swivel time 90°, locked	1,0 s
Positioning tolerance A-axis	± 5"

## ■ Work spindle

Spindle taper	Hollow shank DIN 69893 – HSK – A63
Speed range	1 – 10.000 rpm (1 – 17.500 rpm*)
Run up time $n_{max}$	0,4 s (1,0 s)
Diameter of spindle bearings Ø	80 mm
Power (40% duty cycle)	2 x 32 kW / 4200 rpm
Torque (40% duty cycle)	2 x 72 Nm

## ■ Feed drive

Drive system	Ballscrew
Rapid speed X, Y, Z	65, 75, 75 m/min
Axis acceleration X, Y, Z	10, 10, 15 m/s <sup>2</sup>
Max. feed thrust X, Y, Z	8.000 N

## ■ Accuracy (according to VDI/DGQ 3441)

Position measuring system	Direct, absolute
Positioning tolerance X, Y, Z	$T_p = 0,01$ mm

## ■ Tool magazin

Toolchange system	Pick-Up
Capacity	2 x 20, (2 x 32")
Max. tool diameter ø	70 mm / 160 mm (free adjacent pocket)
Max. tool length	275 mm
Max. tool weight	7,5 kg

## ■ Toolchange

Chip-to-chip time	approx. 2,5 s
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## ■ Weight/Dimensions

Transport dimensions W x H x L	2,45 m x 2,85 m x 3,35 m
Total weight	approx. 12.500 kg
Dimensions (machine installed W x H x L)	3,60 m x 3,15 m x 6,00 m

## ■ Connected load

Operating voltage	3 x 400 Volt, 50 Hz, TN-S/TN-C network
Total connected load	approx. 85 kVA
Mean air consumption	0,5 Nm <sup>3</sup> /min (6 bar)

## ■ CNC control system

Bosch-Rexroth	IndraMotion MTX
GE Fanuc	31i
Siemens	SINUMERIK 840 D

(\*) = optional

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