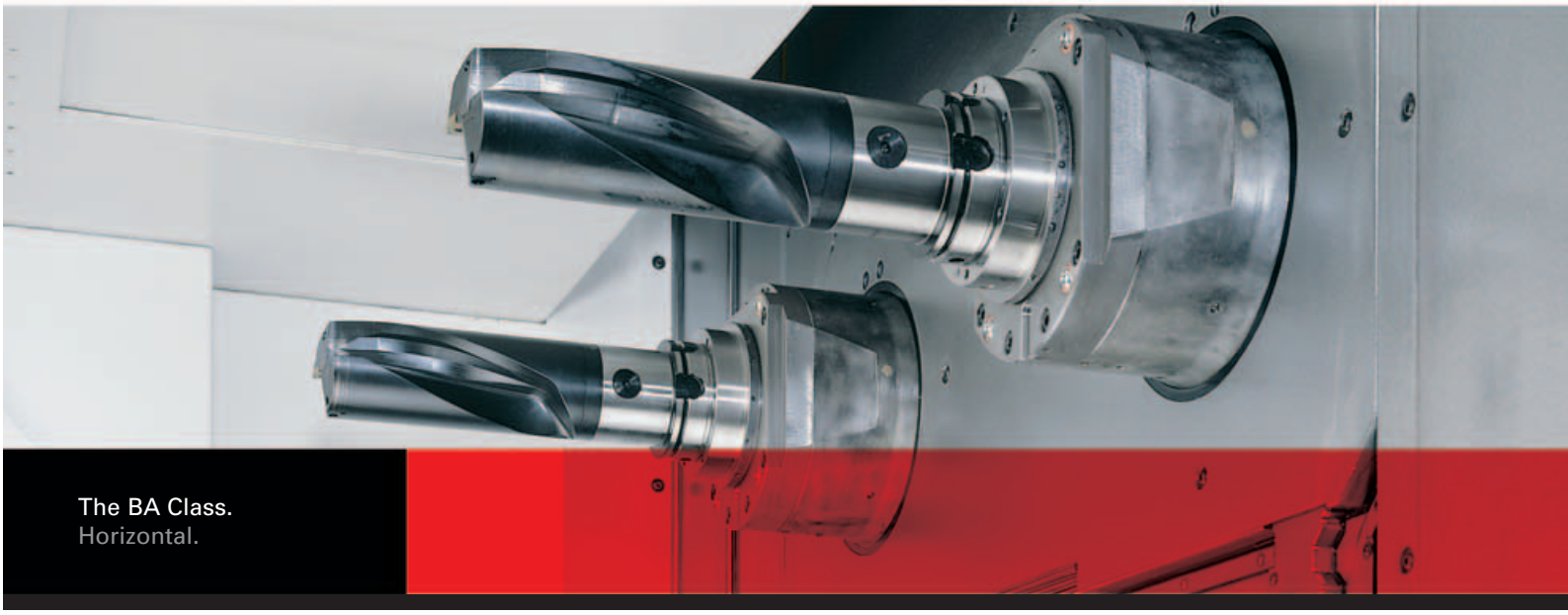
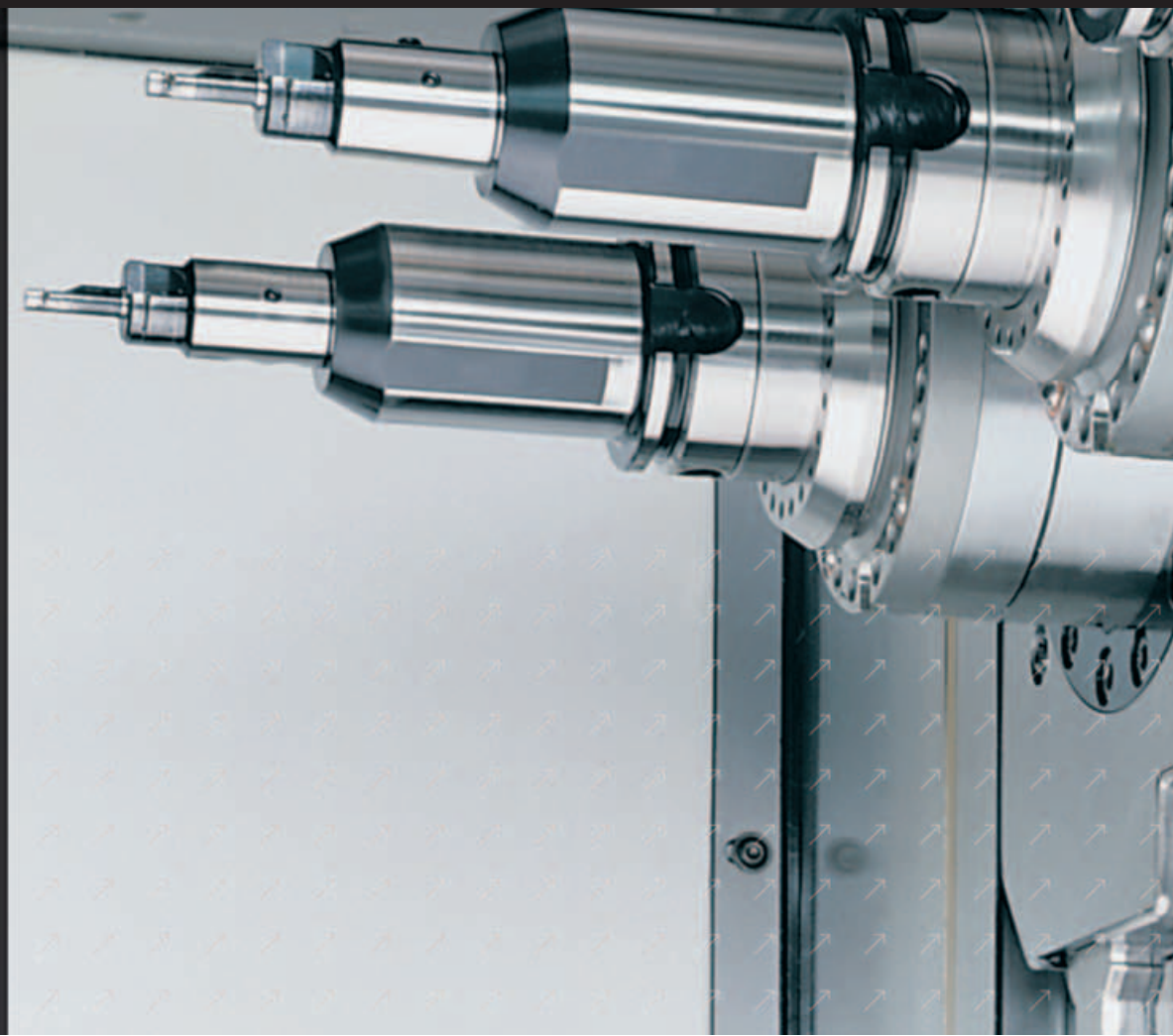
BA 400
BA 600



The BA Class.
Horizontal.

Efficiency.
There are many ways to machine steel and cast iron workpieces. But there are only a few allowing to reach an optimum result in view of the given situation. The SW BA class offers a machining center which has set standards in its class with regard to efficiency and performance and which will continue to do so. The BA 400 and BA 600 centers available with 2 or 4 spindles, with 4 and 5 axes which can be loaded in parallel with the machining process provide for the appropriate concept for your machining process.

The BA Class.
Horizontal.



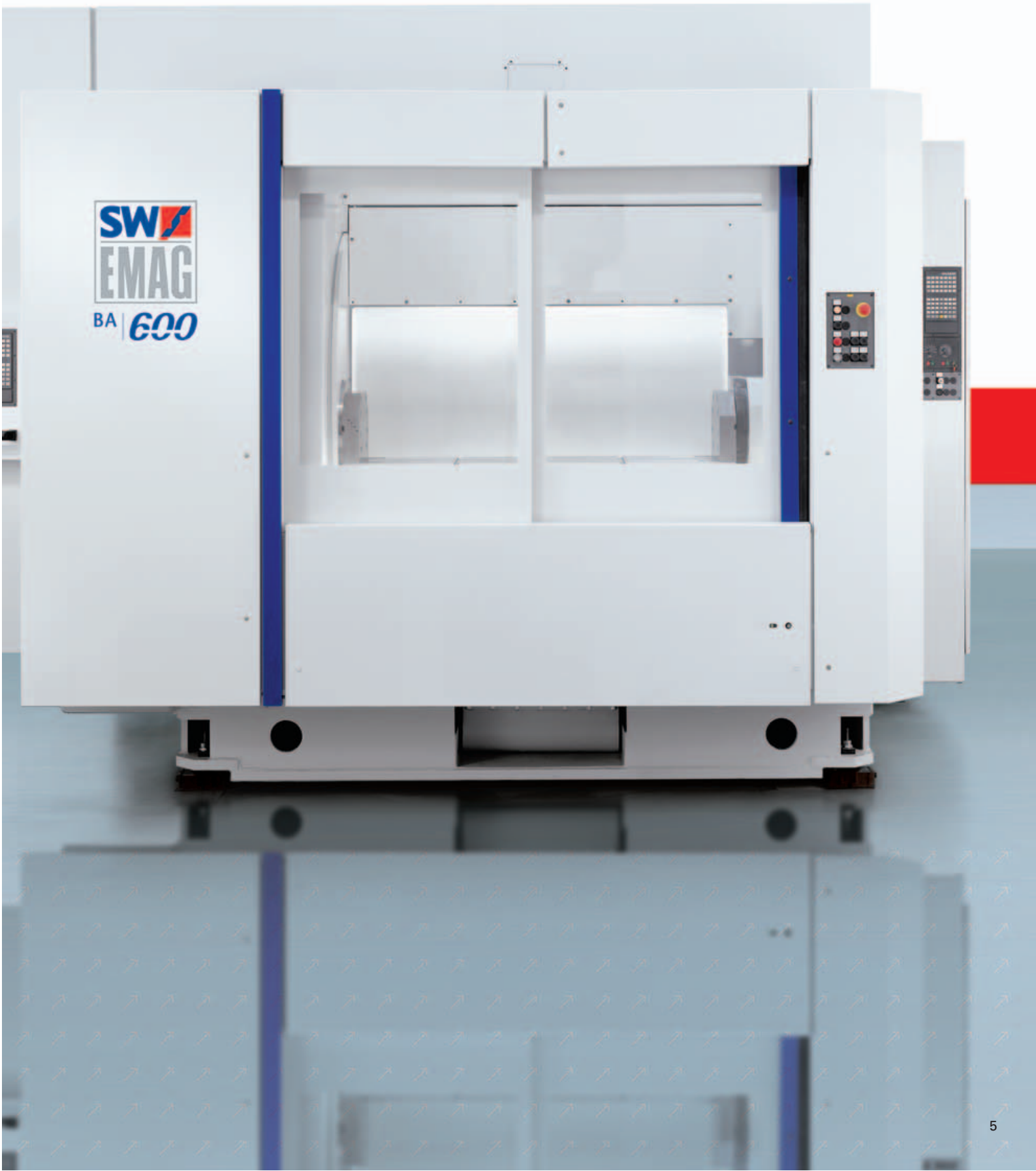

MACHINING CENTRES FOR HEAVY MACHINING.

The BA – A Class of its Own.

The BA Class.
Horizontal.

Often copied – but unequaled.
Since its launch the SW BA series is setting standards in the field of multi-spindle, heavy machining. Due to the excellent accessibility of the loading area from the front and from the top the machine can be loaded and unloaded manually or via an automated system - again in parallel with the machining process. For these machines SW is offering the following controls: Siemens, BoschRexroth and GE Fanuc.

- 2 sizes
- 2 or 4 spindles
- 4 or 5 axes
- Double-sided swivel carrier with two fixtures for workpiece change in parallel to the machining process
- Central cooling unit for highest possible temperature stability

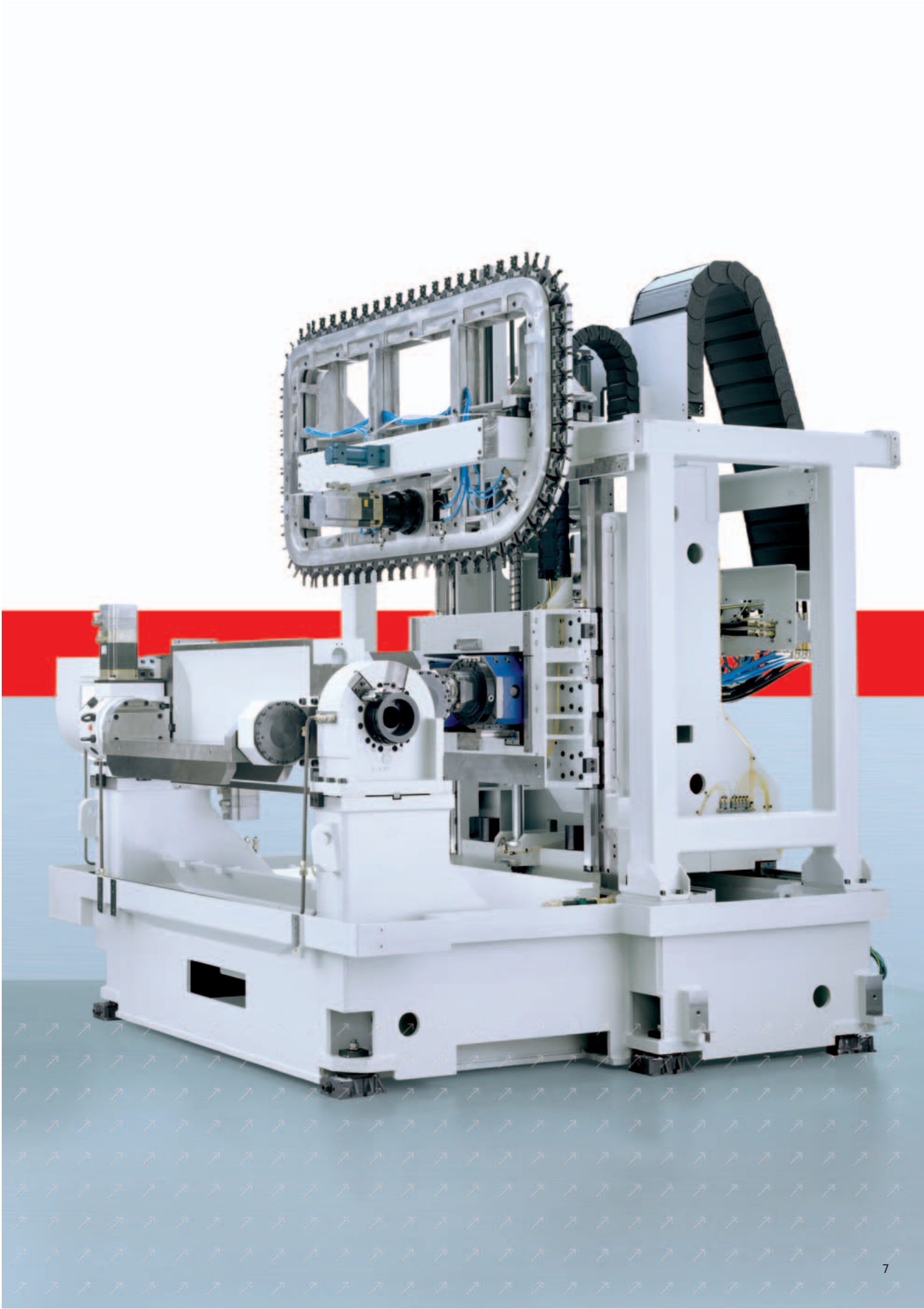

SW
EMAG
BA 600

Robust Design – Perfect Machining.

The BA Class.
Horizontal.

Behind the easily opening machine enclosure you find a robust portal-type machine design featuring a high dynamic rigidity.

- Machine bed designed as a torsion-stiff, high-strength welded steel structure
- Slides made of vibration-damping gray cast iron
- Hydraulic counterbalance in the vertical axis, including safety function
- Direct, absolute position measuring system
- Ballscrews in the linear axes
- Acceleration rates up to 8 m/s^2
- Rapid traverse rates up to 50 m/min
- Feed thrust up to 15 kN



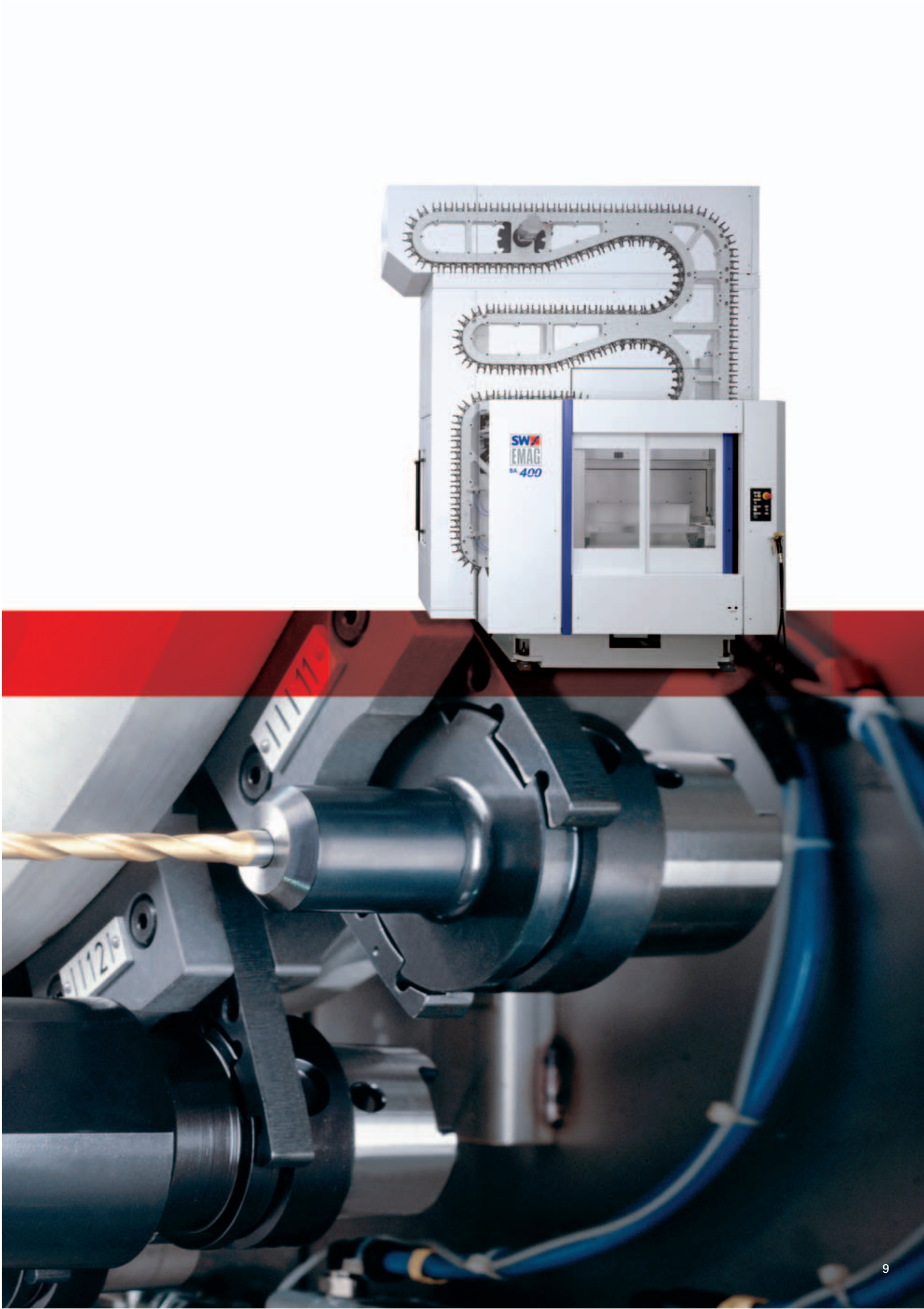
Unmatched Expandable.

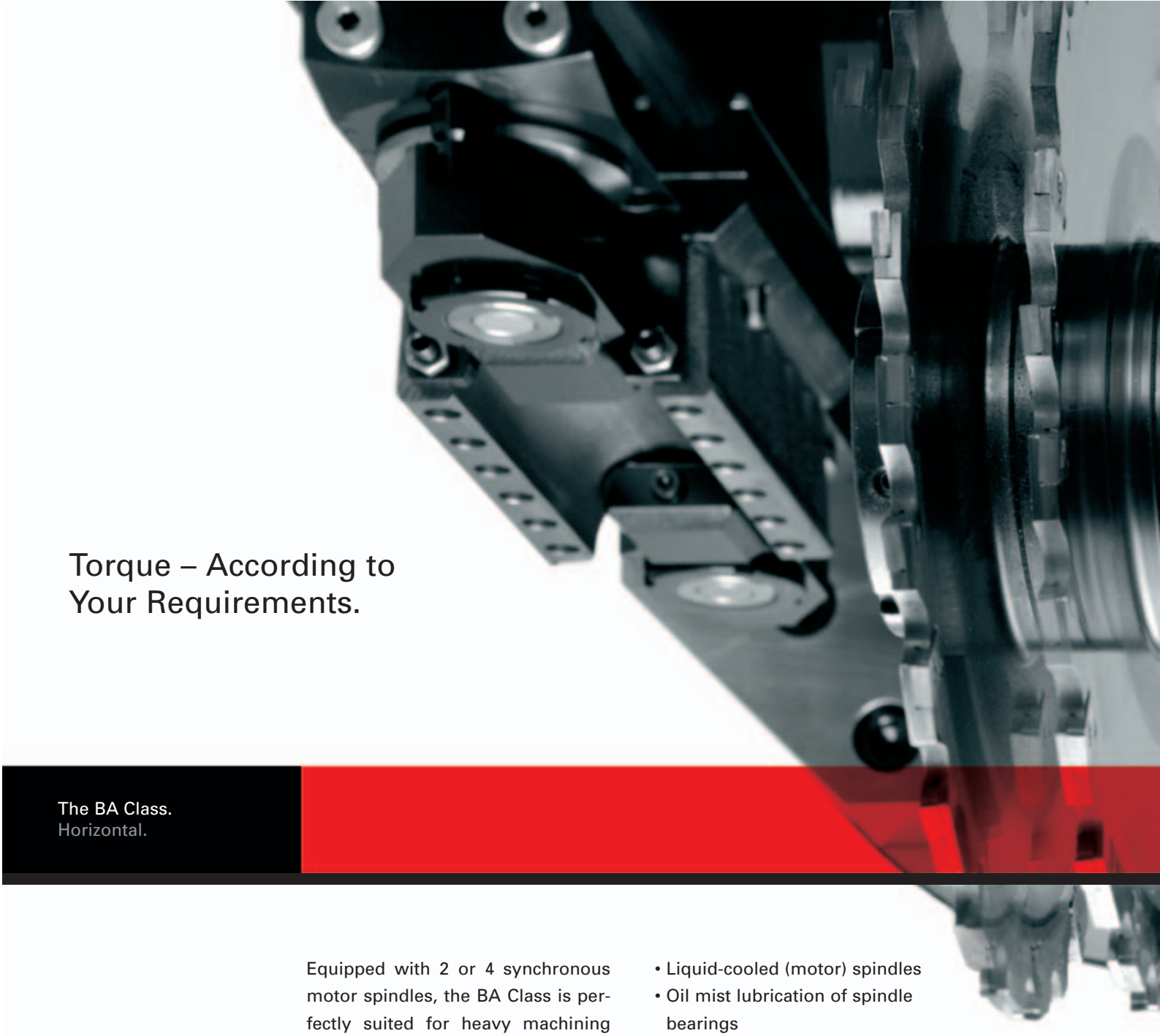
A milled guide slot with guided tool pockets running outside the machining area thus being protected against chips. For mastering even most complex tasks, the tool storage capacity can be expanded up to 224 pockets.

- Pick-up tool change
- Fixed place tool management
- Ergonomic loading position
- Form-fit locked toolholders
- Collision monitoring
- Magazine capacity from 60 to 224 tools

- Max. tool diameter
  160 mm for BA 400
  (250 mm optional)
  250 mm for BA 600
  (350 mm optional)
  340 mm for BA 600-2G
- Max. tool weight
  10 kg for BA 400
  20 kg for BA 600
  25 kg for BA 600-2G

The BA Class.
Horizontal.


SW
EMAG
BA 400



Torque – According to Your Requirements.

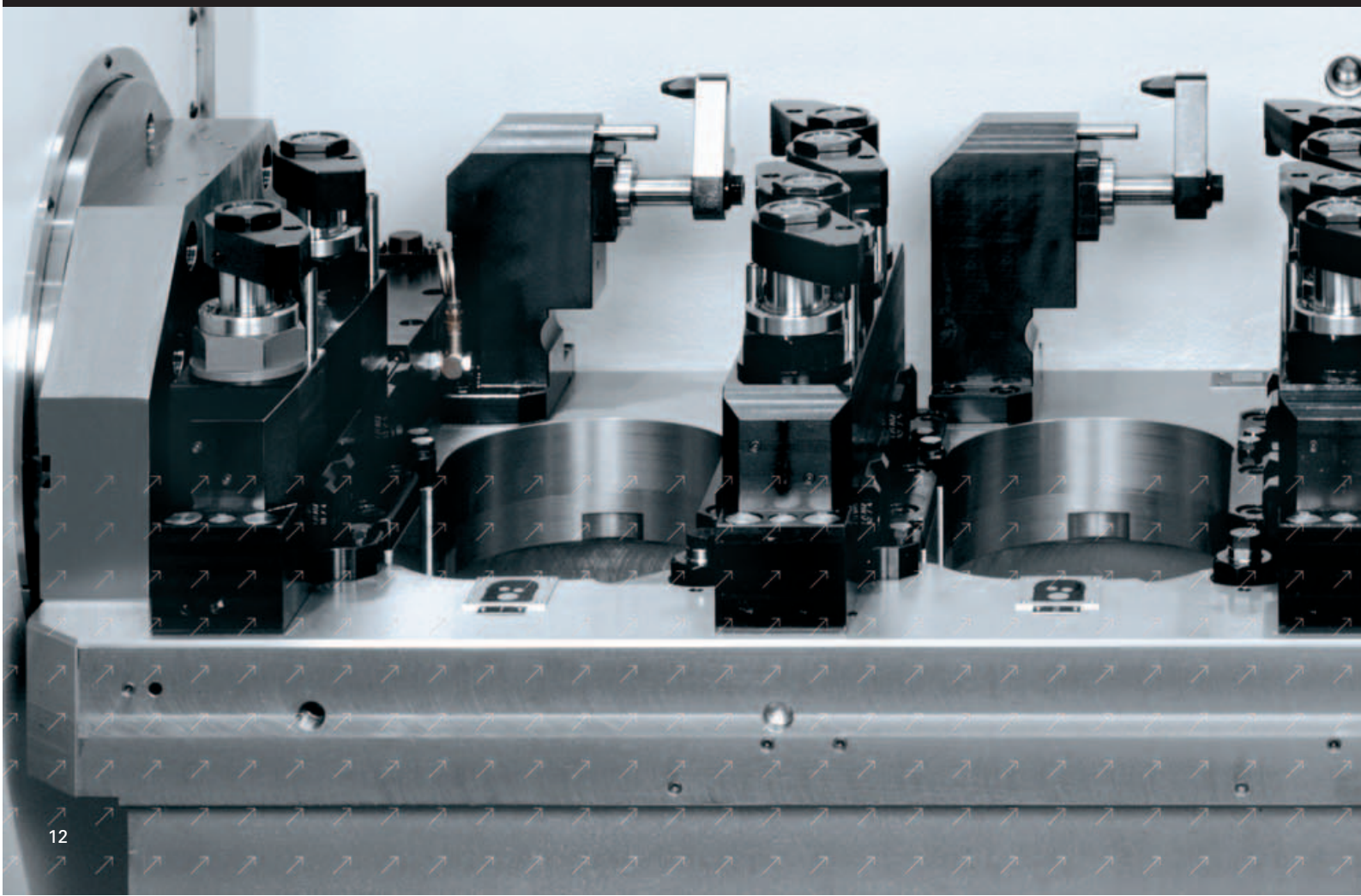
The BA Class.
Horizontal.

Equipped with 2 or 4 synchronous motor spindles, the BA Class is perfectly suited for heavy machining operations. For extremely high torque requirements SW offers the BA 600-2G equipped with gear-driven spindles.

- Liquid-cooled (motor) spindles
- Oil mist lubrication of spindle bearings
- Air sensoring system for tools in the spindle
- Tool monitoring systems
- BA 400
  Spindle power up to 35 kW
  Spindle speed up to 17.500 rpm
  Torque up to 200 Nm/spindle
- BA 600
  Spindle power up to 42 kW
  Spindle speed up to 10.000 rpm
  Torque up to 780 Nm/spindle

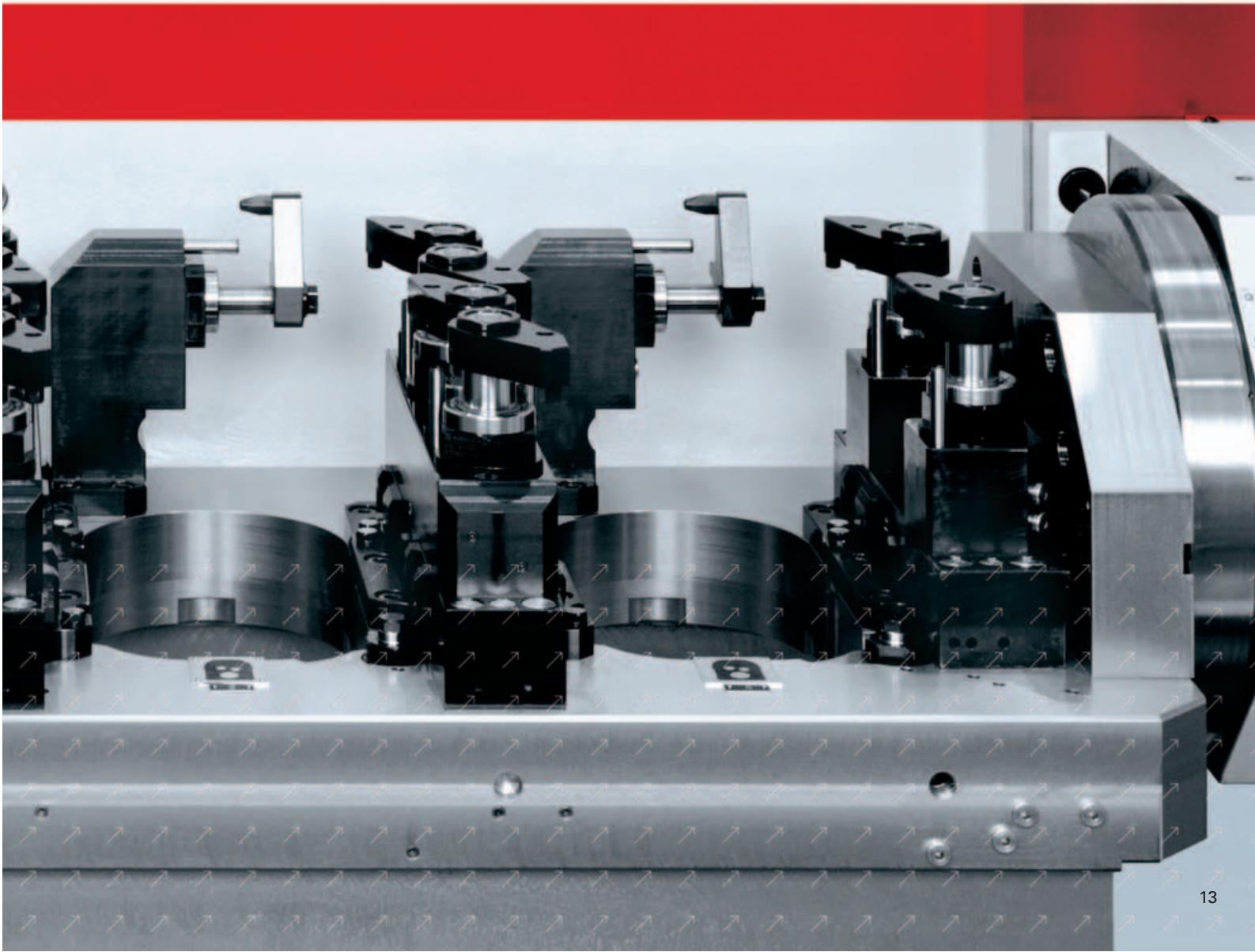
More Parts. Higher Profit.

The BA Class.
Horizontal.



The advantage of multi-spindle machining is simultaneous machining of several workpieces thus considerably reducing costs. It is also possible to assign several workpieces to one spindle. In SW clamping fixtures, designed and manufactured in our plant, up to 64 workpieces can be clamped, machined, washed and measured, that means 128 workpieces in 2 settings.

- 4-axis machining on standard fixture plate
- 5-axis, 5-sided machining with optional two or four satellites
- Unhindered chip flow due to horizontal machining
- Fully enclosed machining area
- Computer-assisted anti-collision and cycle time monitoring before start-up
- NC program optimisation offered as a service for the customer



The BA Class.
Horizontal.

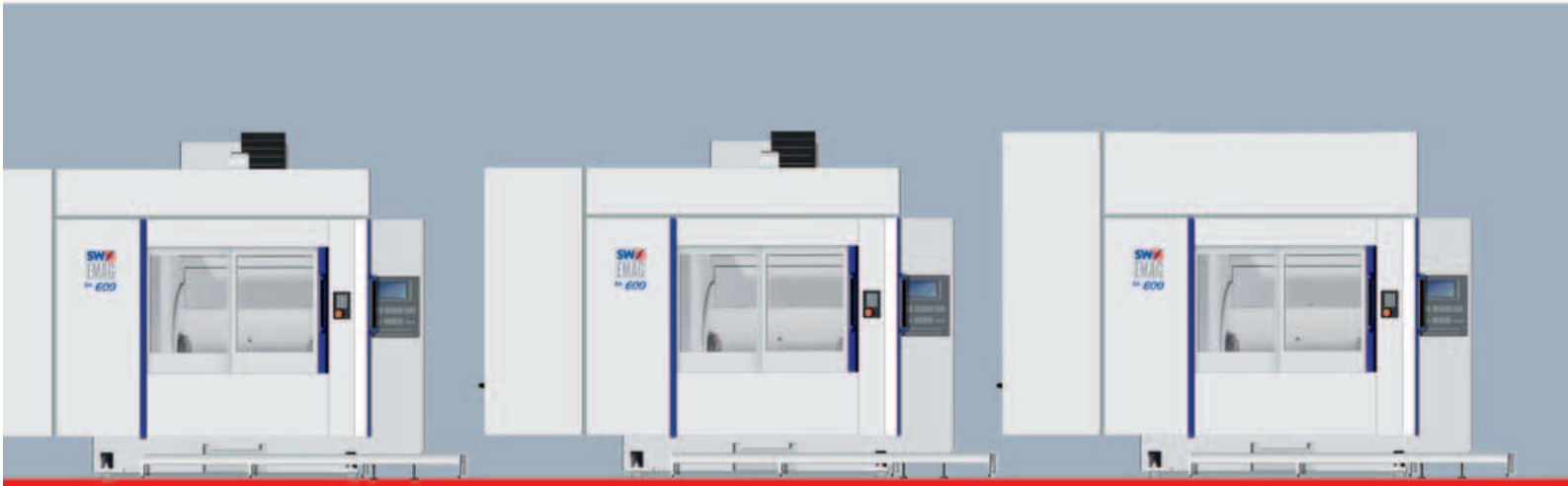
Torque Motor or Worm Drive.

Not all machining operations can be solved by means of 4 axes. As an option, SW offers for the BA class 2 or 4 satellites for 5-axis machining – equipped with worm gear or torque motor drives - depending on the application.

- Satellites driven via worm or torque motor
- Direct, absolute measuring system
- Indexing accuracy +/- 5" for torque motor
- Indexing accuracy +/- 15" for worm gear drive

Range of workpieces.

- Exhaust manifolds
- Common Rail pump housings
- Hydraulic housings
- Wheel hubs for trucks
- Brackets
- Motor blocks
- Brake calipers
- Hinged tie bars
- Bearing caps
- Clamping chucks
- Caliper brackets
- Engine and gearbox housings
- Master brake cylinders
- ABS valve blocks
- Connecting rods for passenger cars
- Hinge hoops
- Hinges
- Gear-shift forks
- Bearing caps
- Hydraulic valve blocks



BA 600-2

- Steering knuckles
- Knuckles (wheel)
- Knuckles (axle)
- Bearing caps
- Connecting rods for trucks
- Caliper brackets for trucks
- Motor blocks
- Swing arms
- Crankshaft housings
- Drill bits

BA 600-2 G

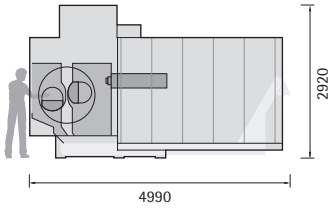
- Calipers for trucks
- Calipers for passenger cars
- Steering knuckles for trucks
- Turbo charger housings
- Crankshaft bearing caps

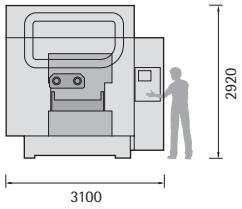
BA 600-4

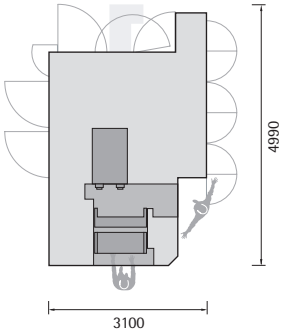
- Steering knuckles
- Knuckles (wheel)
- Hinges
- Caliper brackets
- Housings
- Calipers

Technical Data BA 400.

BA 400-2







	BA 400-2
■ Working range	
X-axis	400 mm
Y-axis (toolchange position)	450 mm (700 mm)
Z-axis	400 mm
Spindle distance	400 mm
Swivel table/end support with crown gear; swivelling time 0/180°	approx. 4 s
2 NC-rotary tables with end support, hydraulically locked, speed of face plate	33,3 rpm
■ Work spindle	
Spindle taper	Hollow shank DIN 69893 – HSK – A63
Diameter of spindle bearings	80 mm
■ Power at S6/40 % duty cycle (standard)	
Power	2 x 25 kW/2.800 rpm
Max. torque	2 x 85 Nm
Speed range	1 – 12.500 rpm (1 – 17.500 rpm*)
■ Power at S6/40 % duty cycle (option)	
Power	2 x 35 kW/2.800 rpm
Max. torque	2 x 120 Nm (2 x 200 Nm, S6/25 % ED*)
Speed range	1 – 12.500 min^{-1} (1 – 10.000 rpm*)
■ Feed rate	
X, Z	1 – 50.000 mm/min
Y	1 – 50.000 mm/min
Max. feed thrust X, Y, Z	9.250 N
■ Tool magazine	
Capacity	2 x 30 (2 x 60*) (2 x 92*)
Max. tool diameter	75 mm/160 mm (free adjacent place)
Max. tool length	300 mm
Max. tool weight	10 kg
■ Toolchange	
Chip-to-chip time	approx. 3,8 s
■ Accuracy (according to VDI/DGQ 3441)	
Positioning tolerance	Tp = 0,010 mm
■ Connected load	
Operating voltage	3 x 400 Volt, 50 Hz, TN-S/TN-C network
Total connected load	approx. 68 KVA
Mean air consumption	0,6 Nm^3/min (6 bar)
■ CNC control system	
GE Fanuc	16i
SIEMENS	SINUMERIK 840 D
■ Weight	
Machine including switch cabinet	approx. 12.000 kg
■ Dimensions	
machine installed, (W x H x L)	approx. 3,1 x 3,0 x 5,0 m
Transport dimensions (machine without peripheral equipment W x H x L)	approx. 3,1 x 3,0 x 4,2 m

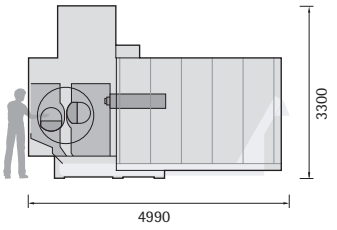
(*) = optional

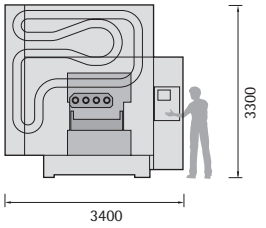
Specification depends on machine equipment – for GE FANUC on demand. Subject to modification without prior notice!

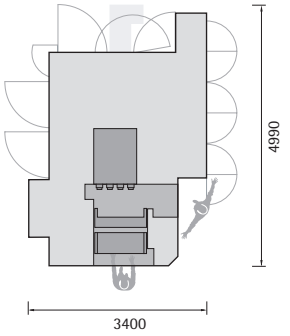
BA 400-4

200 mm
450 mm (700 mm)
400 mm
200 mm
approx. 4 s
33,3 rpm
Hollow shank DIN 69893 – HSK – A63
65 mm
4 x 16 kW/3.000 rpm
4 x 50 Nm
1 – 17.500 rpm
4 x 25 kW/3.000 rpm
4 x 80 Nm
1 – 10.000 rpm*
1 – 45.000 mm/min
1 – 50.000 mm/min
11.000 N
4 x 30 (4 x 46*)
70 mm/125 mm (free adjacent place)
300 mm
6 kg
approx. 4,2 s
Tp = 0,010 mm
3 x 400 Volt, 50 Hz, TN-S/TN-C network
approx. 100 KVA
1,2 Nm^3/min (6 bar)
16i
SINUMERIK 840 D
approx. 13.000 kg
approx. 3,4 x 3,3 x 5,0 m
approx. 3,3 x 3,3 x 4,8 m

BA 400-4

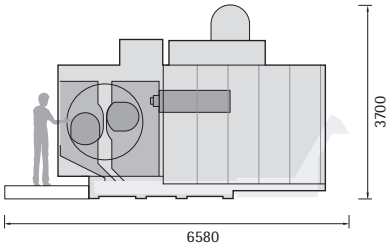


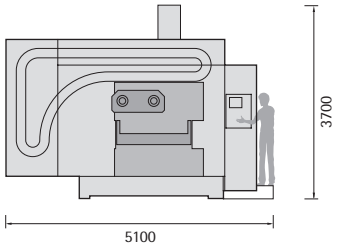


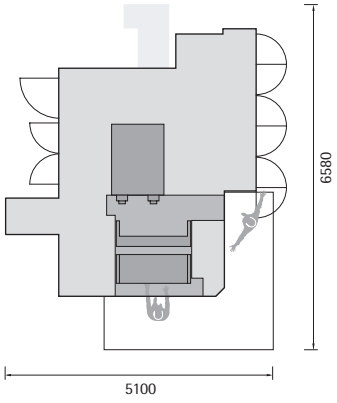


Technical Data BA 600.

BA 600-2 / BA 600-2G







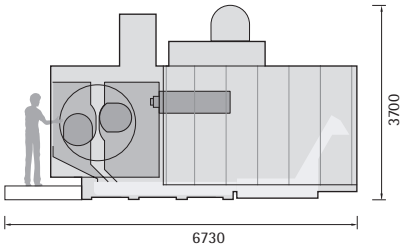
	BA 600-2
Working range	
X-axis	600 mm
Y-axis (toolchange position)	600 mm (975 mm)
Z-axis	500 mm
Spindle distance	600 mm
Swivel table/end support with crown gear; swivelling time 0/180°	approx. 6 s
2 NC-rotary tables with end support, hydraulically locked, speed of face plate	25 rpm
Work spindle	
Spindle taper	Hollow shank DIN 69893 – HSK – A100
Diameter of spindle bearings	100 mm
Power at S6/40 % duty cycle (standard)	
Power	2 x 38 kW/1.000 rpm
Max. torque	2 x 363 Nm
Speed range	1 – 10.000 rpm
Power at S6/40 % duty cycle (option)	
Power	
Max. torque	
Speed range	
Feed rate	
X, Y, Z	1 – 45.000 mm/min
Max. feed thrust X, Y	15.000 N
Max. feed thrust Z	15.000 N
Tool magazine	
Capacity	2 x 40 (2 x 50*)
Max. tool diameter	100 mm/250 mm (free adjacent place)
Max. tool length	420 mm
Max. tool weight	20 kg
Toolchange	
Chip-to-chip time	approx. 4,9 s
Accuracy (according to VDI/DGQ 3441)	
Positioning tolerance	Tp = 0,010 mm
Connected load	
Operating voltage	3 x 400 Volt, 50 Hz, TN-S/TN-C network
Total connected load	approx. 120 KVA
Mean air consumption	1,2 Nm^3/min (6 bar)
CNC control system	
Bosch-Rexroth	Indramat MTC
GE FANUC	16i
Siemens	SINUMERIK 840 D
Weight	
Machine including switch cabinet	approx. 20.000 kg
Dimensions	
Dimensions (machine installed), without paper tape filter (W x H x L)	approx. 5,1 x 3,8 x 6,6 m
Dimensions (machine installed), with paper tape filter (W x H x L)	approx. 5,1 x 3,8 x 8,7 m
Transport dimensions (machine without peripheral equipment W x H x L)	3,4 x 3,3 x 3,8 m (machine element 1) 4,2 x 3,0 x 2,4 m (machine element 2)

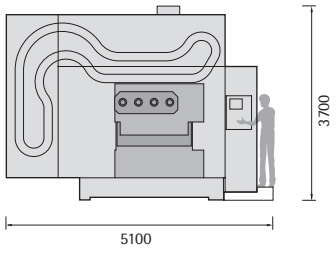
(*) = optional

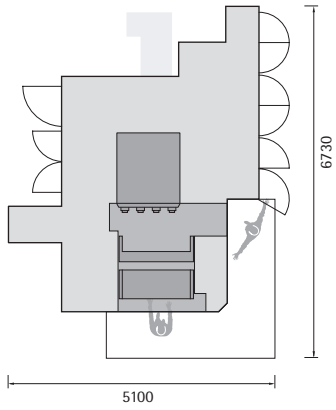
Specification depends on machine equipment – for Bosch-Rexroth and GE FANUC on demand. Subject to modification without prior notice!

BA 600-2G	BA 600-4
600 mm	300 mm
550 mm (975 mm)	600 mm (975 mm)
360 mm	500 mm
600 mm	300 mm
approx. 6 s	approx. 6 s
25 rpm	25 rpm
Hollow shank DIN 69893 – HSK – A100	Hollow shank DIN 69893 – HSK – A63
100 mm	80 mm
2 x 31 kW/375 rpm	4 x 25 kW/2.800 rpm
2 x 780 Nm	4 x 85 Nm
1 – 5.000 rpm	1 – 12.500 rpm (1 – 17.500 rpm*)
	4 x 35 kW/2.800 rpm
	4 x 120 Nm (2 x 200 Nm, S6/25 % ED*)
	1 – 12.500 rpm (1 – 10.000 rpm*)
1 – 45.000 mm/min	1 – 45.000 mm/min
15.000 N	15.000 N
15.000 N	20.000 N
2 x 40 (2 x 25*)	4 x 30
100 mm/340 mm (free adjacent place)	80 mm/160 mm (free adjacent place)
300 mm	350 mm
25 kg	10 kg
approx. 4,9 s	approx. 5,1 s
Tp = 0,010 mm	Tp = 0,010 mm
3 x 400 Volt, 50 Hz, TN-S/TN-C network	3 x 400 Volt, 50 Hz, TN-S/TN-C network
approx. 110 KVA	approx. 150 KVA
1,2 Nm^3/min (6 bar)	1,2 Nm^3/min (6 bar)
	30i
SINUMERIK 840 D	SINUMERIK 840 D
approx. 20.000 kg	approx. 20.000 kg
approx. 5,1 x 3,8 x 6,6 m	approx. 5,1 x 3,8 x 6,7 m
approx. 5,1 x 3,8 x 8,7 m	approx. 5,1 x 3,8 x 8,7 m
3,4 x 3,3 x 3,8 m (machine element 1) 4,2 x 3,5 x 2,4 m (machine element 2)	4,1 x 3,4 x 3,8 m (machine element 1) 4,6 x 3,4 x 2,3 m (machine element 2)

BA 600-4







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The BA Class.
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