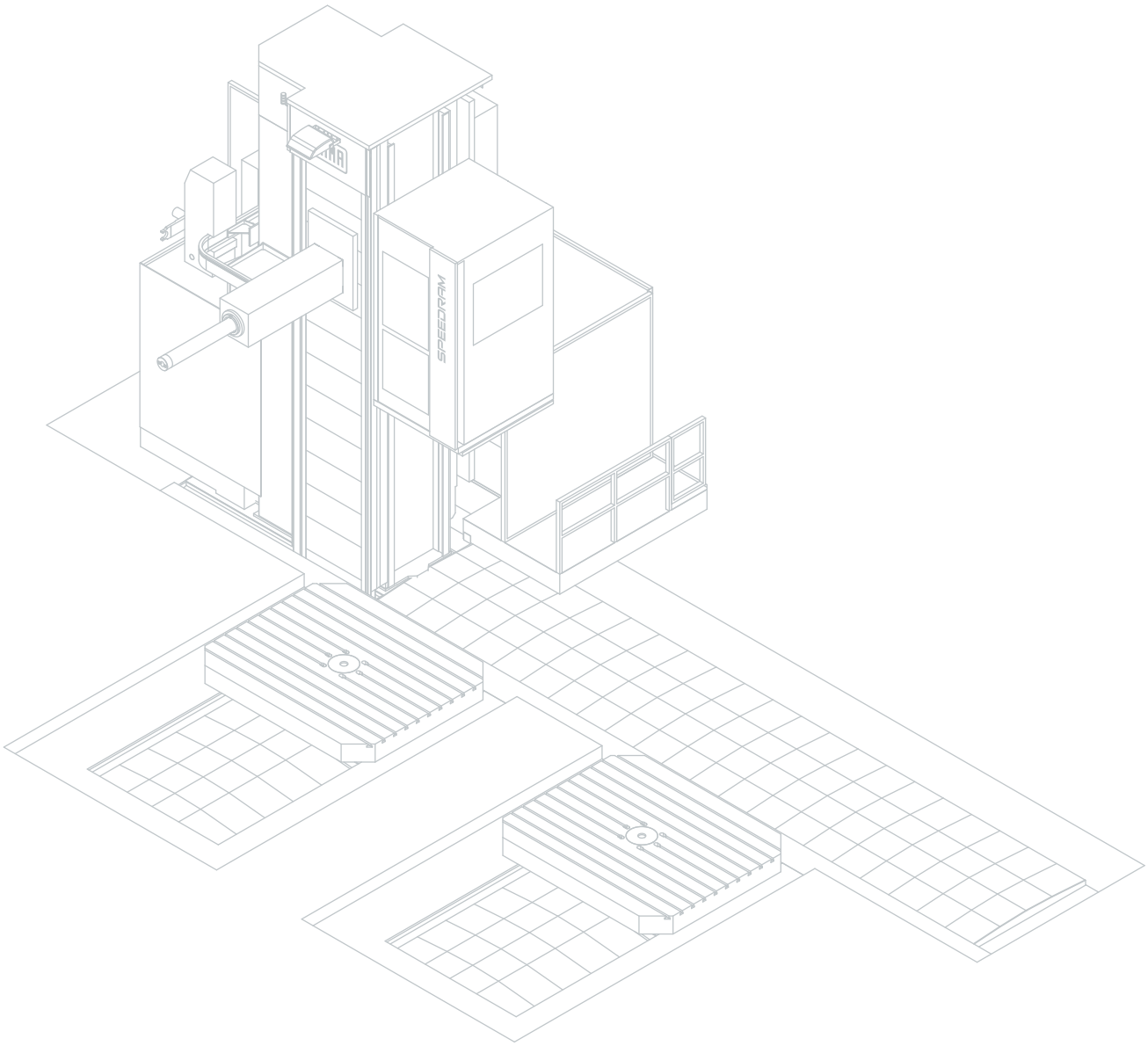
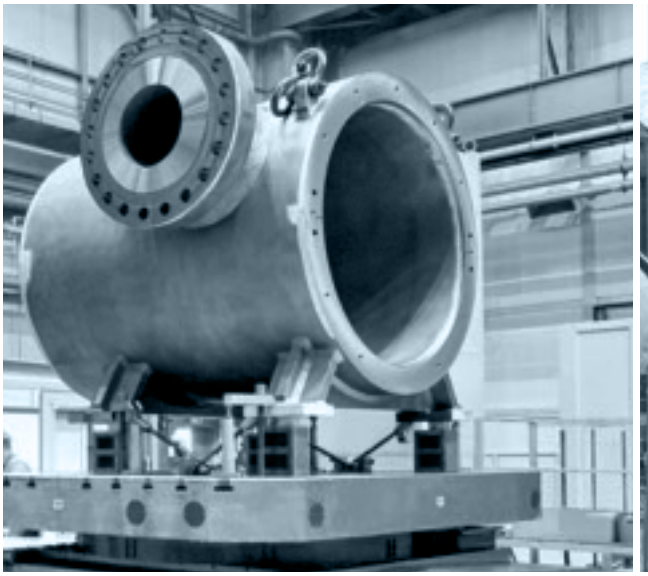
PAMA



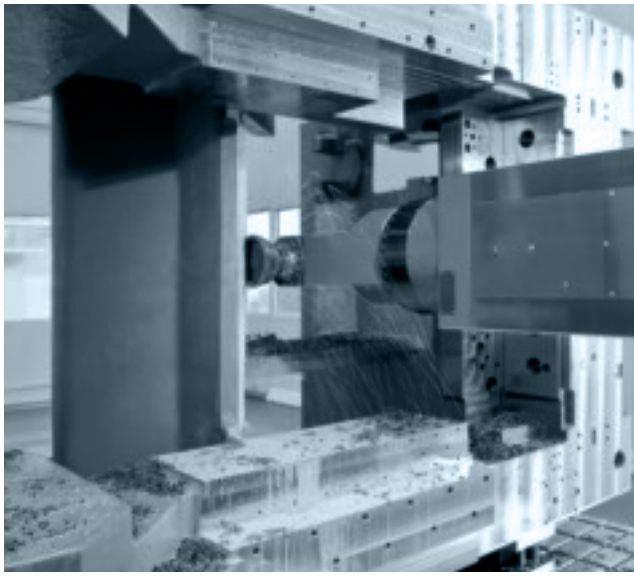
SPEEDRAM HP

FLOOR TYPE BORING AND MILLING MACHINES

TARGET AND APPLICATION



ENERGY
OIL & GAS
SHIPBUILDING
EARTH MOVING
GENERAL MACHINING



Speedram HP line is designed for high precision, power and structural rigidity, providing the perfect machining solution for the most demanding applications on all heavy, medium to large size components, requiring high material removal rate coupled to high precision and superior finishing even in hard-to-cut materials.

Speedram HP product range consists of 6 models of horizontal boring and milling machines with boring spindle diameter from 120 mm to 180 mm and vertical stroke from 2000 mm to 10000 mm.

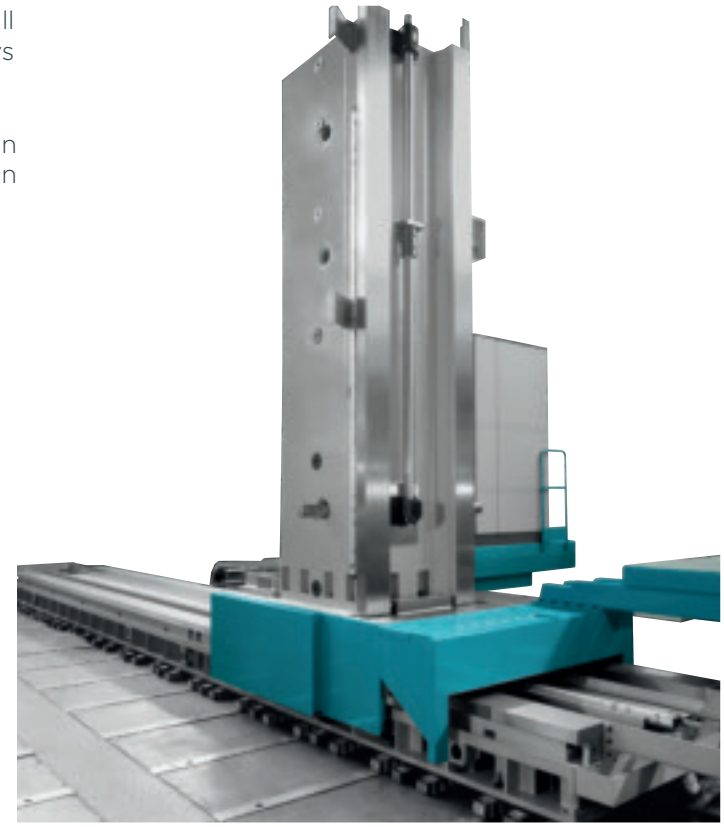
FLOOR TYPE BORING AND MILLING MACHINES


PAMA
SPEEDRAM

MACHINE FEATURES

all linear axes with full hydrostatic guideways

double wall column construction



monolithic cast iron headstock with hydrostatic support on all sides

individually hand scraped hydrostatic bronze pads guarantee maximum accuracy of the oil film thickness and performance

TECHNICAL SOLUTIONS

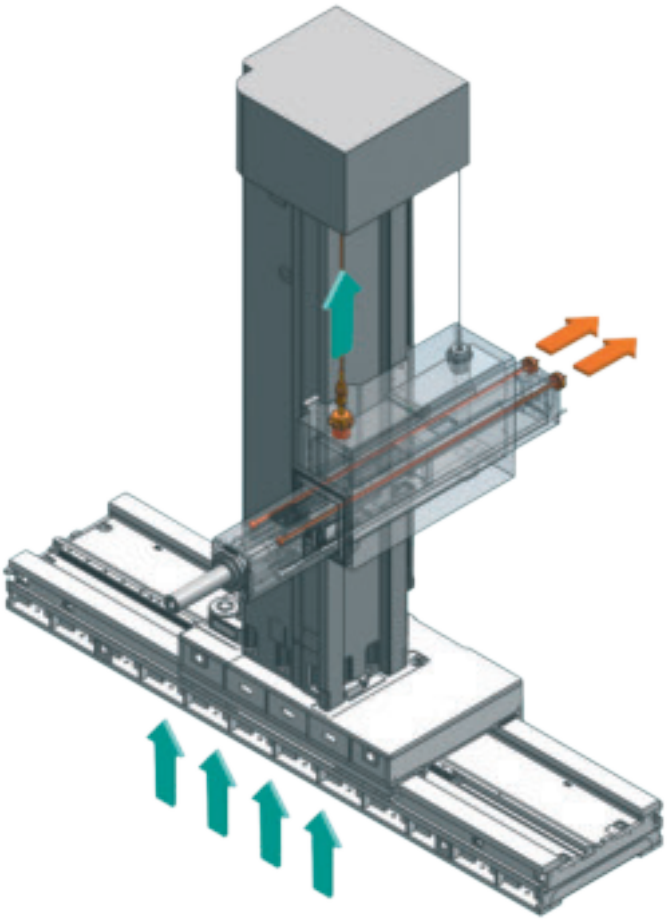
rectangular ram
fully enclosed
in a monolithic
headstock casting
with hydrostatic
support on all sides

Direct spindle drive™
improved spindle stiffness and
dynamic performances
rigid tapping without heavy limitation
increased tool life

Higher reliability:
mechanical components reduced by
30%,
simpler auxilary devices (hydraulics
and electrics)

**Hybrid spindle bearings with
variable preload:**
higher spindle speed,
higher stiffness at low speed

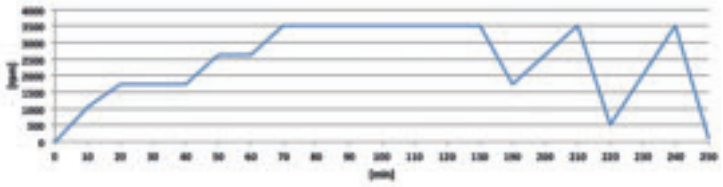
real time CNC
controlled geometric
compensation of ram
droop and sag and
headstock tilt



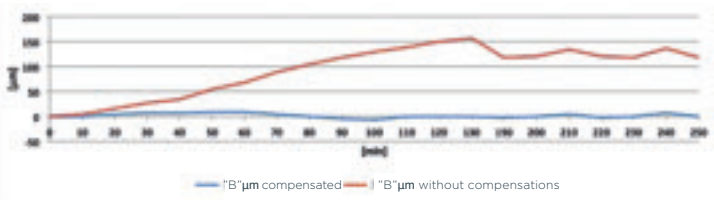
DSD (Direct Spindle Drive): No gearbox

HMC (Hydraulic Machine Compensation): Real time
CNC controlled compensation of ram deflection,
headstock tilting, column deflection and base rotation

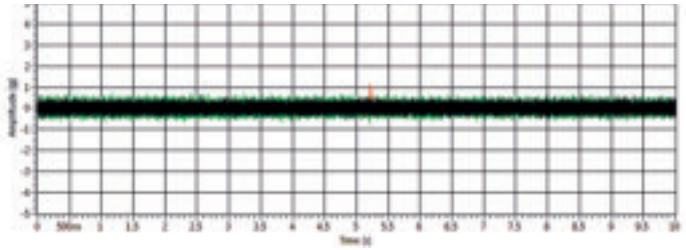
spindle speed



boring bar nose displacement



waveform graph



HSS (Hydrostatic Sliding Spindle):
precise stiffness and dampening: control for better machining in difficult conditions: no metal on metal contact, no stick slip, less risk of bar surface damage, for higher positioning accuracy, less vibration and longer tool life.

unique PAMA innovative oil supply system:
less flow required, no supplementary hydraulic power pack and piping, no supplementary chiller, energy saving

automatic head attachment change (available as option)

ATC (Automatic Thermal Compensation): real time CNC controlled exclusive compensation of ram and spindle elongation / contraction by direct measurement (PAMA patents)

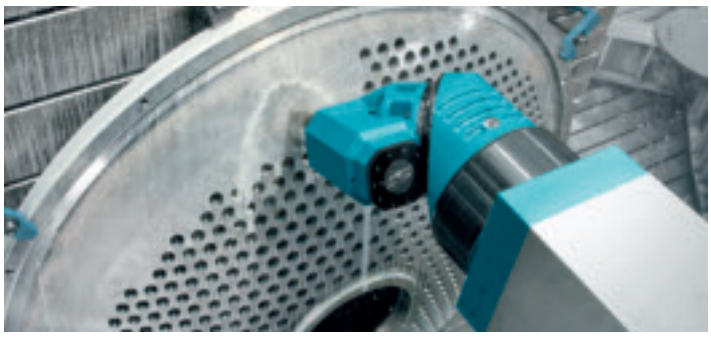
HSS (Hydrostatic Sliding Spindle): boring spindle sliding on hydrostatic bearings

HEAD ATTACHMENTS

the versatility of the Speedram HP machines is further enhanced by the wide range of attachments available, all capable of being automatically loaded / unloaded for maximum efficiency

TW 2 AC
2 axes contouring head

TU
universal head



TS
right angle head

TTL
universal head with orthogonal axes

UT
facing head

CSH (Clever Sensored Heads): equipped with temperature and acceleration sensors, allows for continuous head monitoring and predictive maintenance

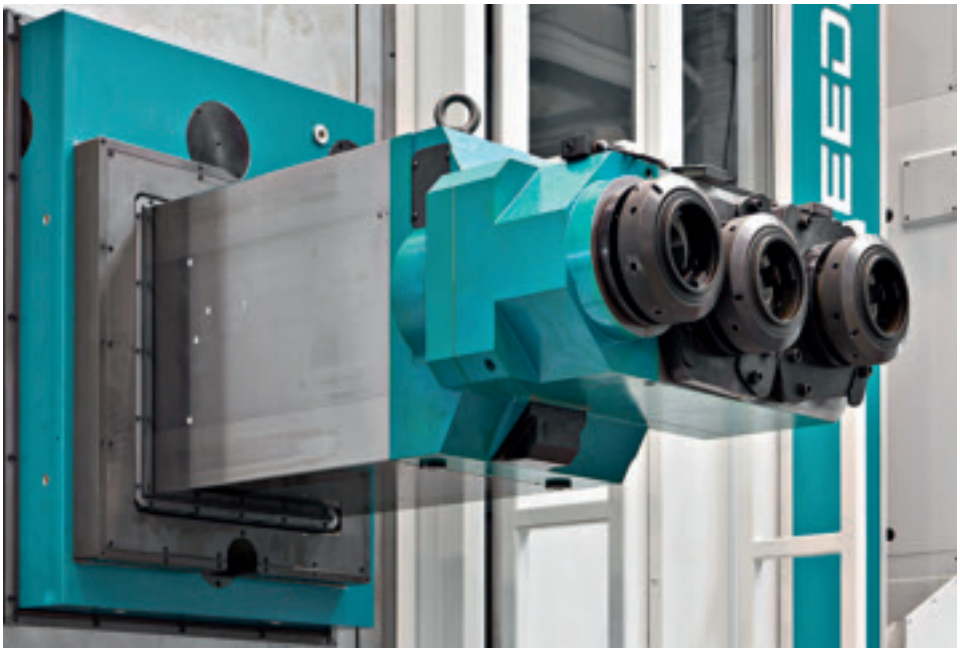
AHC (Automatic Head Calibration): automatic verification of head geometry and adjustment of offset parameters

PMP (PAMA Maintenance Program): software system reminds operators and maintenance personnel of scheduled PM activities

HEAD STORAGE

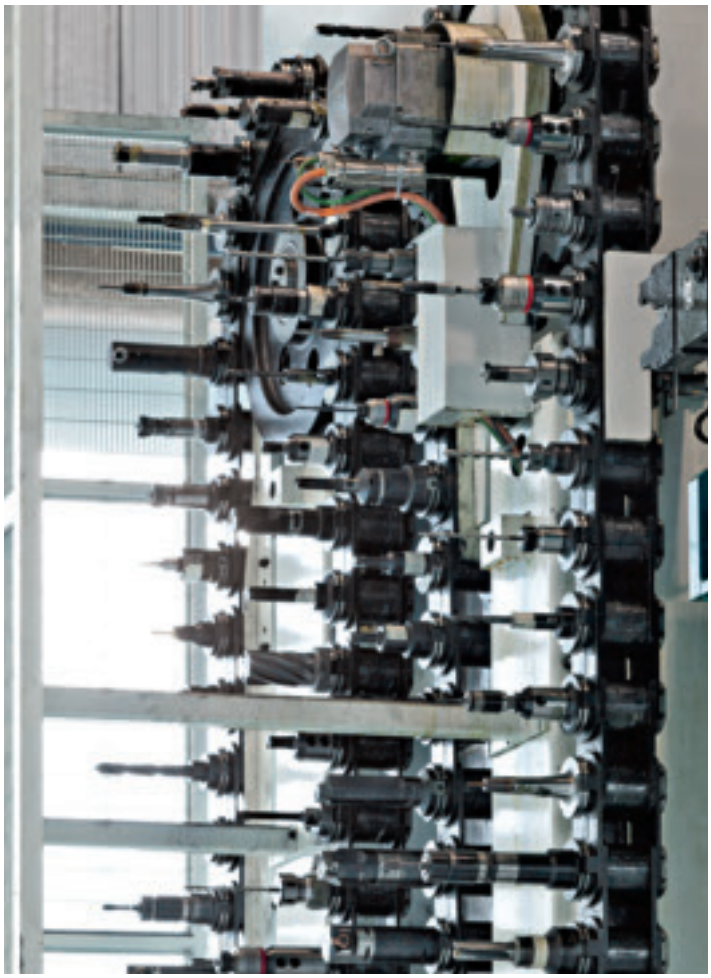
PAMA will design and produce any specialty head requirements leading the industry to specific technological solutions

CUSTOMIZED SOLUTUONS



TOOL MAGAZINES

productivity of Speedram HP machines is further enhanced by a complete range of tool magazine options



rack type tool magazines, column side mounted, with capacity up to 200 tools

chain type tool magazines, column side mounted, with capacity from 60 to 140 tools

rack type tool magazines, floor mounted and served by robot, with capacity up to 1000 tools

TOOL MAGAZINE*

Tool magazine type		chain
Tool magazine capacity	places	60 / 140
Max. tool diameter	mm	420
Max. tool lenght	mm	600
Max. tool weight	kg	35
Max. tool tilting moment	Nm	60

* larger magazine configurations available upon request

ROTOTRAVERSING TABLES

PAMA produces a wide range of hydrostatic rototraversing tables naturally complementing the Speedram HP machines. Optimal integration of machines and tables is achieved thanks to the commonality of technology and solutions used

HYDROSTATIC ROTOTRAVERSING TABLES

		TH 50	TH 65	TH 80	TH 100	TH 120
loading capacity	t*	50	65	80	100	120
table surface - min.	mm	2000 x 2000	2500 x 2500	2500 x 2500	3000 x 3000	3000 x 3000
table surface - max.	mm	3000 x 3000	3500 x 3500	4000 x 4000	4500 x 4500	5000 x 5000
V axis longitudinal travel	mm	1500 - 4000	1500 - 4500	1500 - 4500	2000 - 4500	2000 - 4500

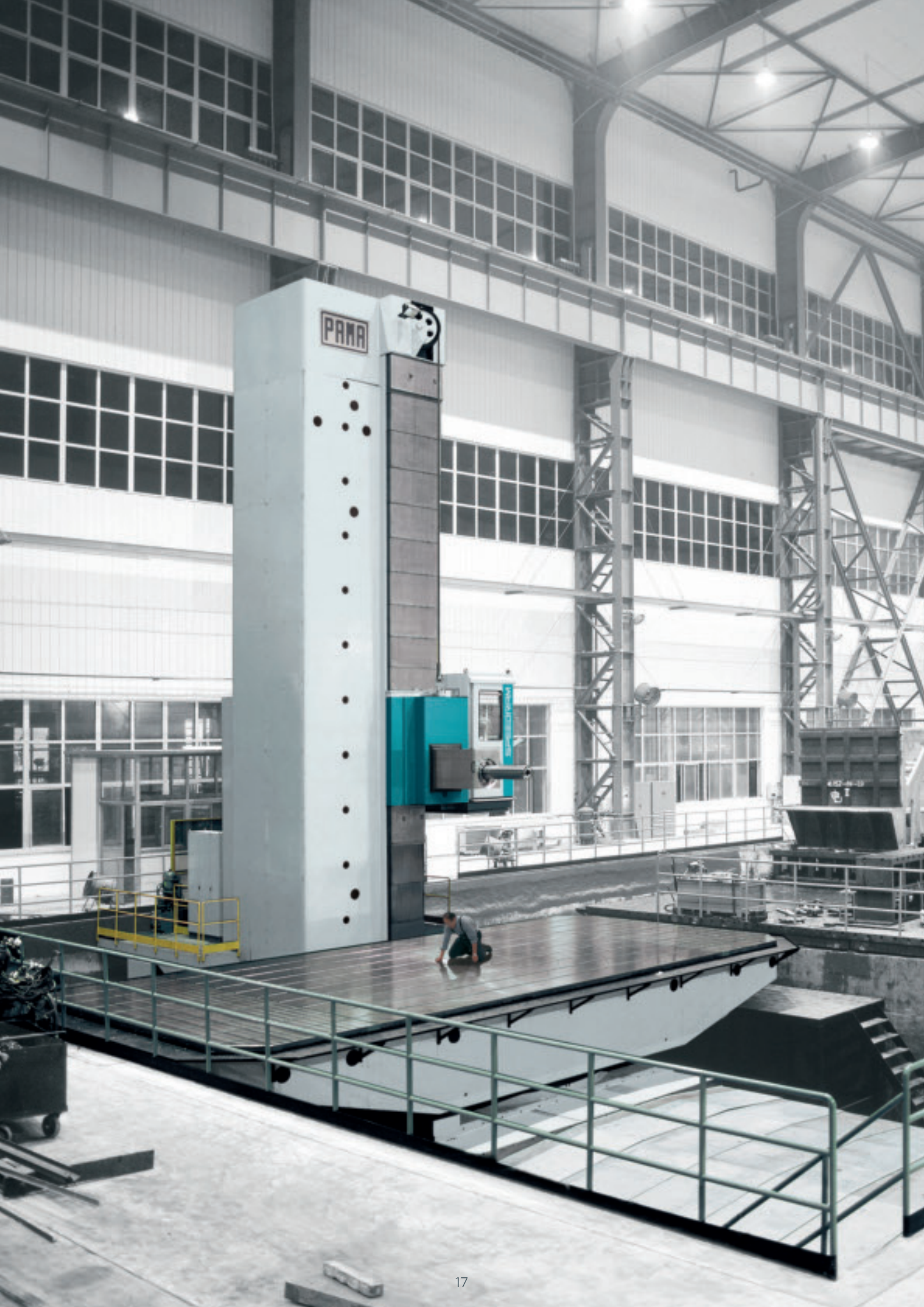
		TH 160	TH 250	TH 300	TH 600
loading capacity	t*	160	250	300	600
table surface - min.	mm	4000 x 4000	4500 x 4500	5000 x 5000	5000 x 6000
table surface - max.	mm	6000 x 6000	6000 x 8000	5000 x 10000	5000 x 10000
V axis longitudinal travel	mm	3000 - 5000	5000 - 7000	5000 - 8000	5000 - 8000

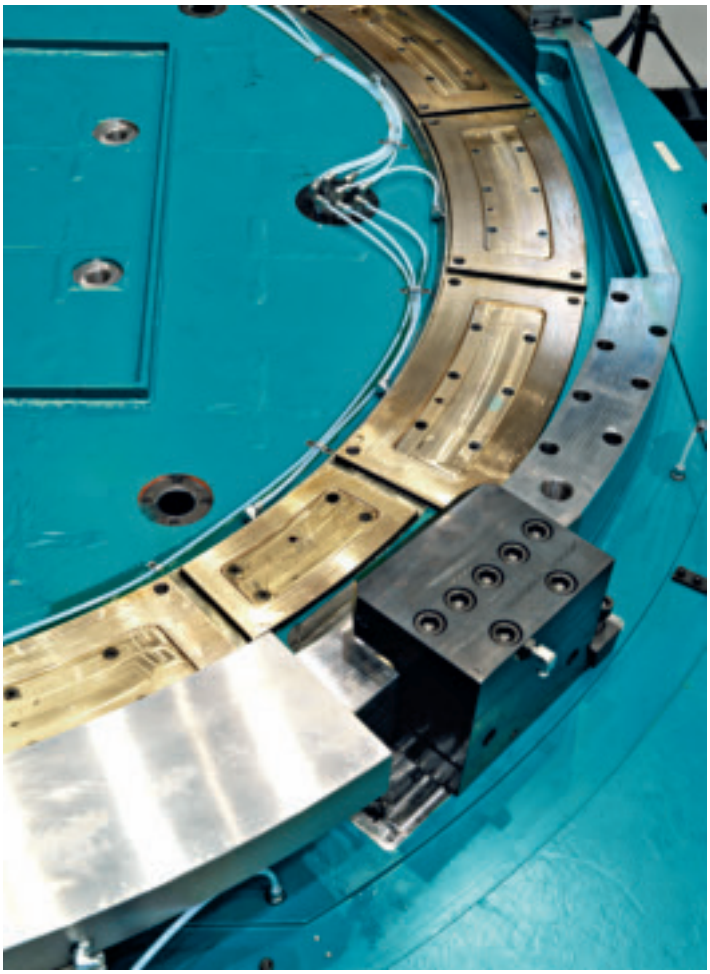
* t in metric ton
tables with other dimensions and loading capacity are available upon request

hydrostatic support for both rotary table and linear traversing axis

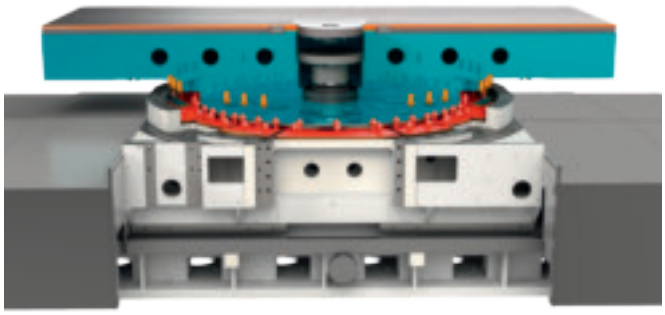
HTC (Hydrostatic Tilting Compensation): automatically detects and compensates the tilting moment from unbalanced table loads (PAMA patented)

PTB (PAMA Thrust Bearing): full hydrostatic table axial bearing


PAMA



PTB (PAMA Thrust Bearing):
full hydrostatic table axial bearing
preload by hydrostatic counterways
more than 50% encreased tilting stiffness
no table deformation due to preload
no preload changes due to thermal expansion



self adjusting hydraulic
brakes on rotary table (B axis)

ROTOTRAVERSING TABLES

HTC (Hydrostatic Tilting Compensation): automatically detects and compensates the tilting moment created from unbalanced table loads (PAMA patented)

B axis is driven via bull gear and double pinion system (preloaded for backlash free operation)

HTC (Hydrostatic Tilting Compensation): automatically detects and compensates the tilting moment from unbalanced table loads (PAMA patented)

PTB (PAMA Thrust Bearing): full hydrostatic table axial bearing

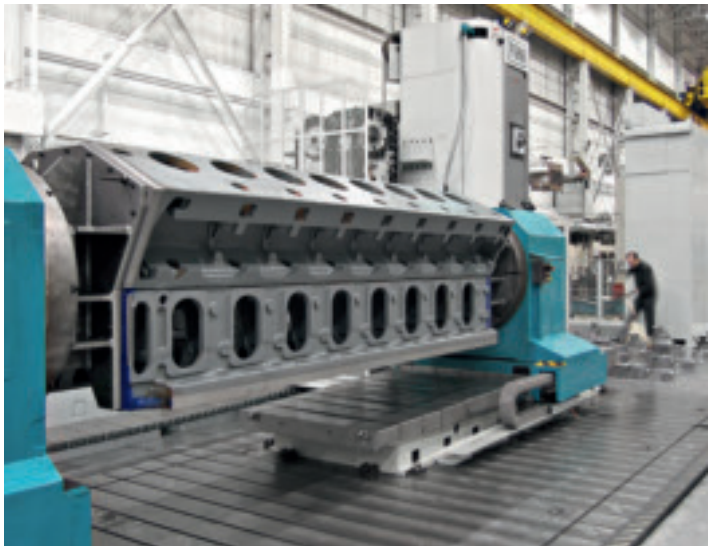
ACCESSORIES

a large number of accessories can be interfaced with Speedram HP

hydrostatic steady rest, divider and tailstock

hydrostatic steady rest

hydrostatic steady rests, intermediate rests, divider head

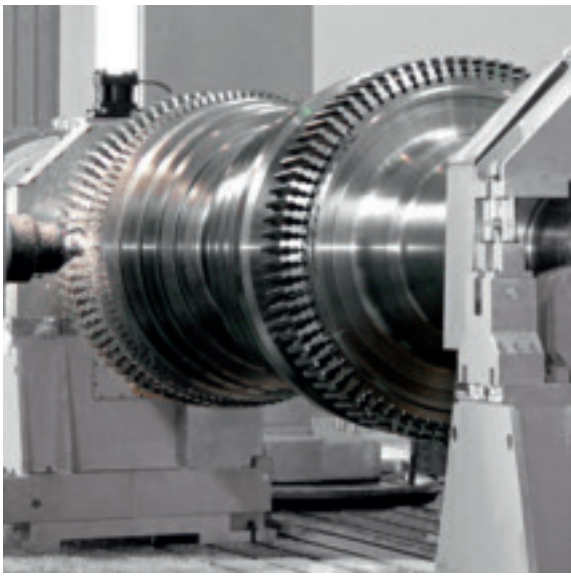


trunnions

APPLICATIONS

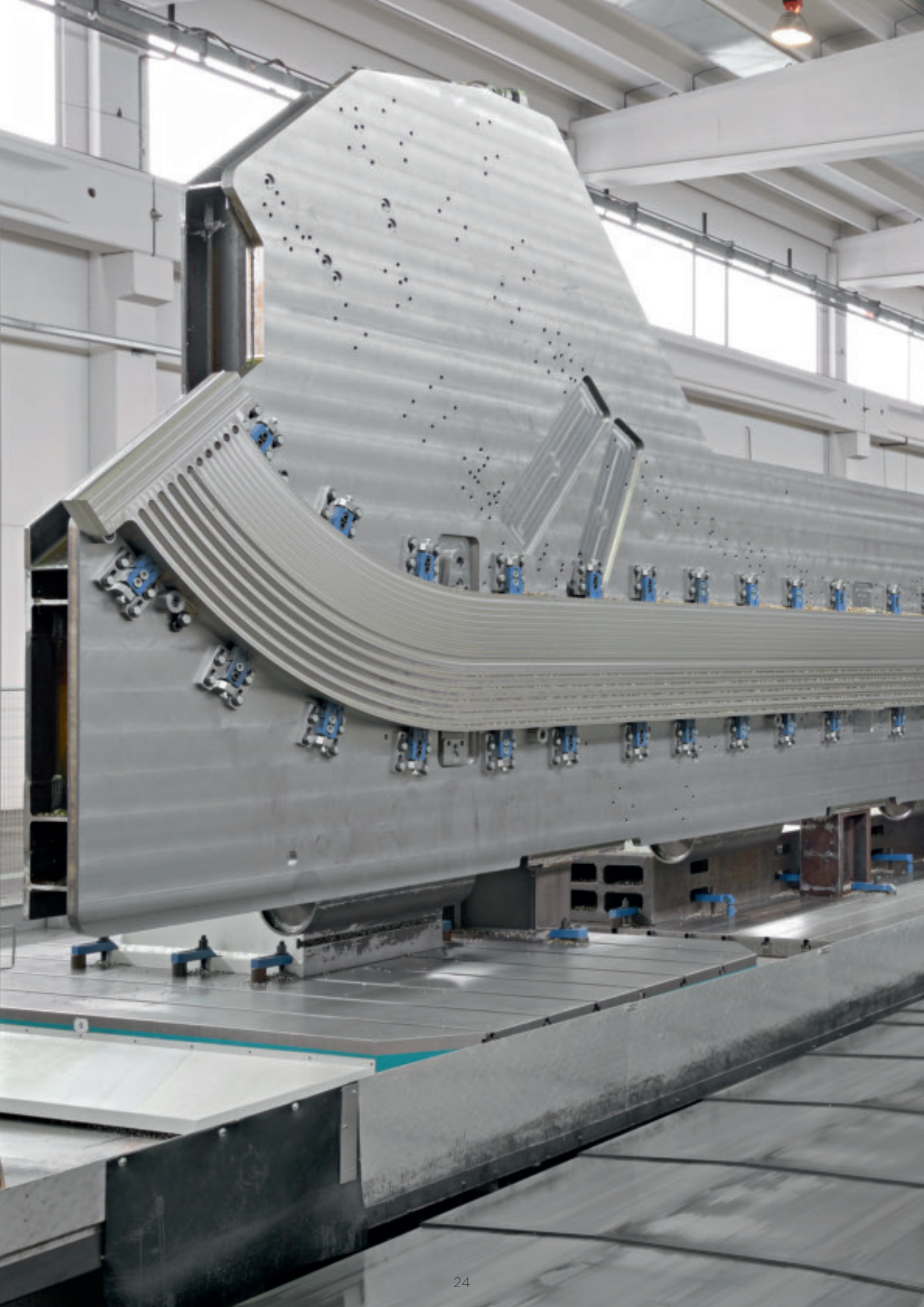
POWER
GENERATION
wind power
generation
nacelle

POWER
GENERATION
steam turbine
rotor



POWER
GENERATION
steam turbine
case

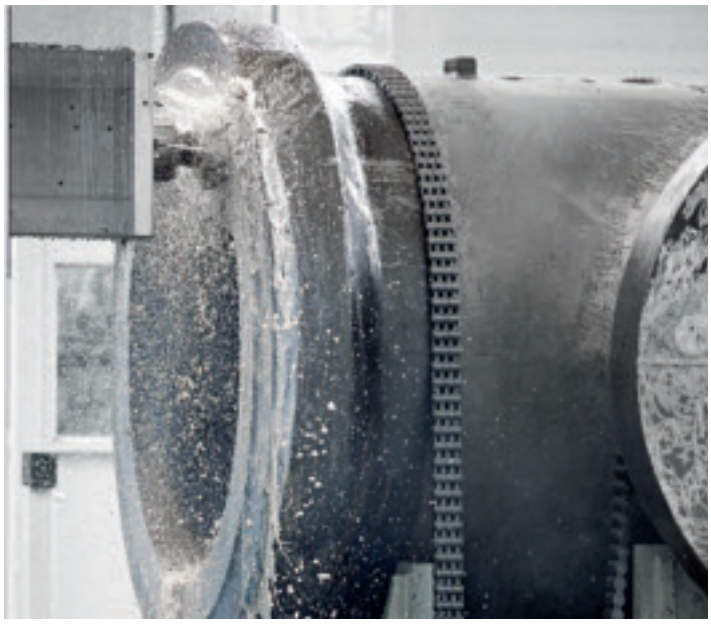
POWER
GENERATION
hydraulic
turbine
pelton rotor



APPLICATIONS

APPLICATIONS

OIL & GAS
valve



GENERAL MACHINING

EARTHMOVING
hydraulic
excavator
upper frame

SHIPBUILDING
variable pitch
propeller blade

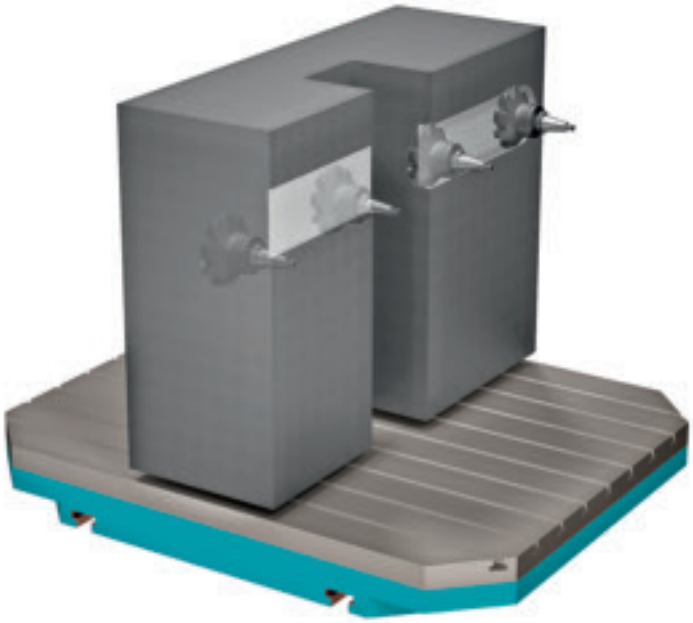
HTC (Hydrostatic Tilting Compensation):
automatically detects and compensates the tilting moment from unbalanced table loads (PAMA patented)

PTB (PAMA Thrust Bearing):
full hydrostatic table axial bearing

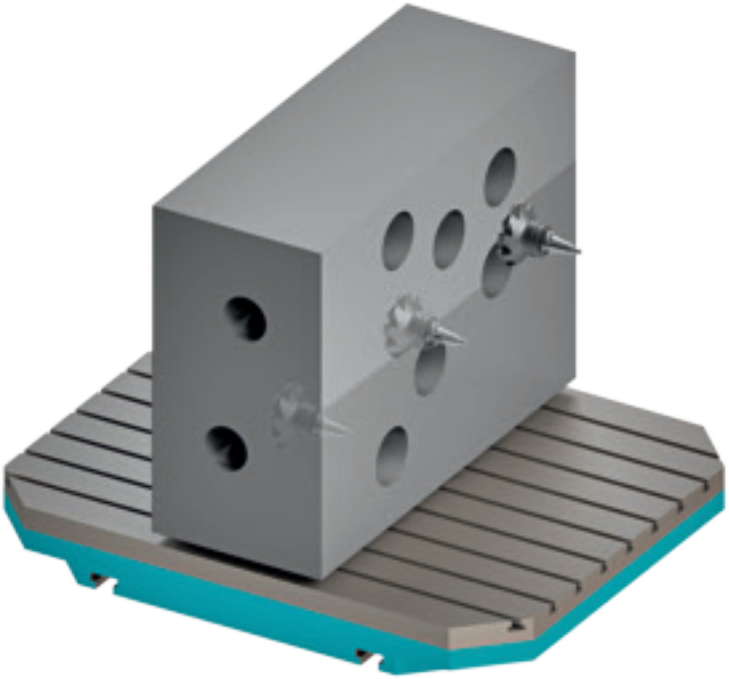
APPLICATIONS

The new DSD technology (Direct Spindle Drive) thanks to the elimination of the geartrain and therefore zero backlash at the tool, allows a significant improvement in the quality and the cycle time in all processes but especially in interrupted cut situations.

Higher feed rate approaching or exiting a cut

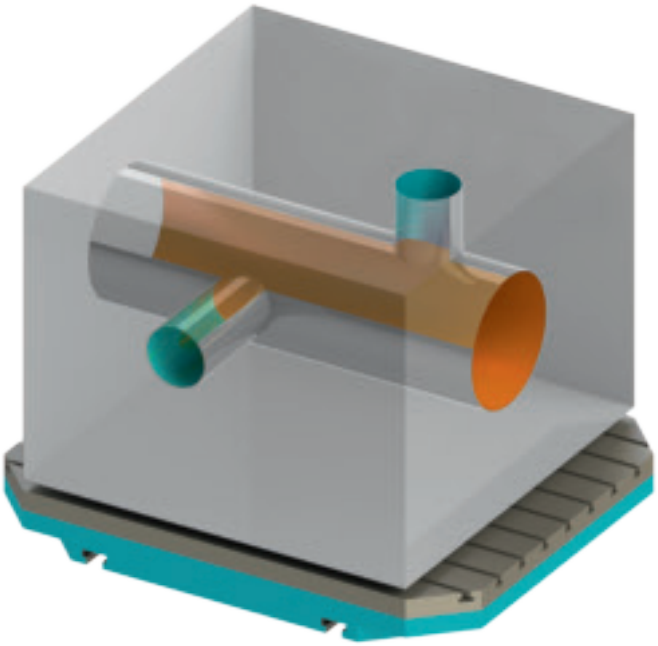


Better finish even on surfaces with existing holes or high roughness

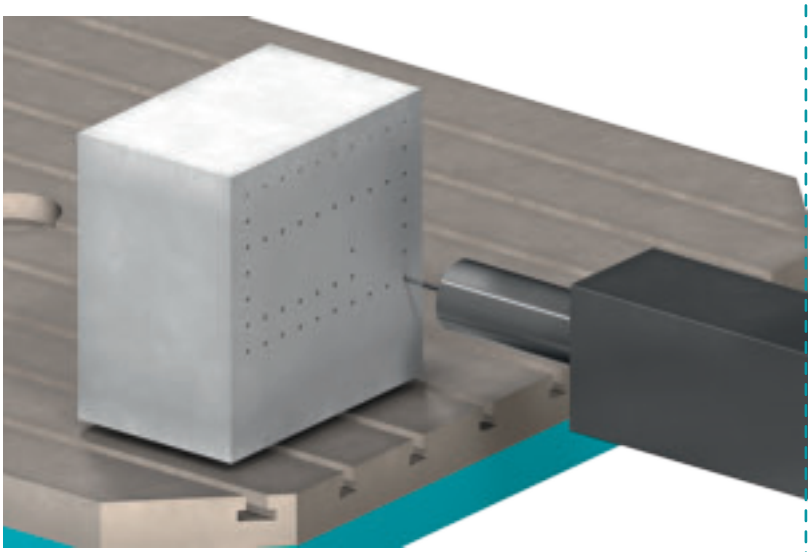


DSD (Direct Spindle Drive): No gearbox

Machining bores with interrupted cut with more aggressive cutting parameters



Rigid tapping even with small diameter taps



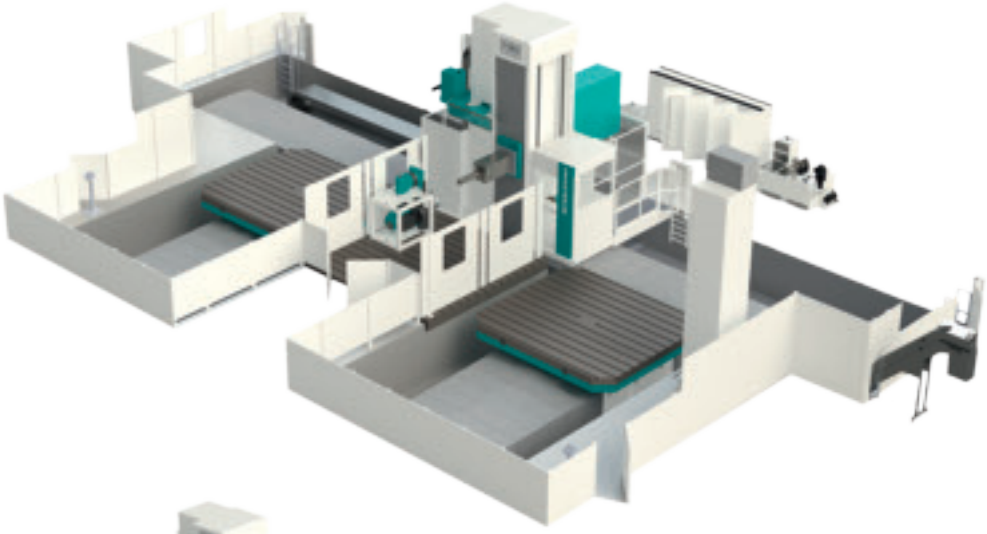
DSD (Direct Spindle Drive): No gearbox

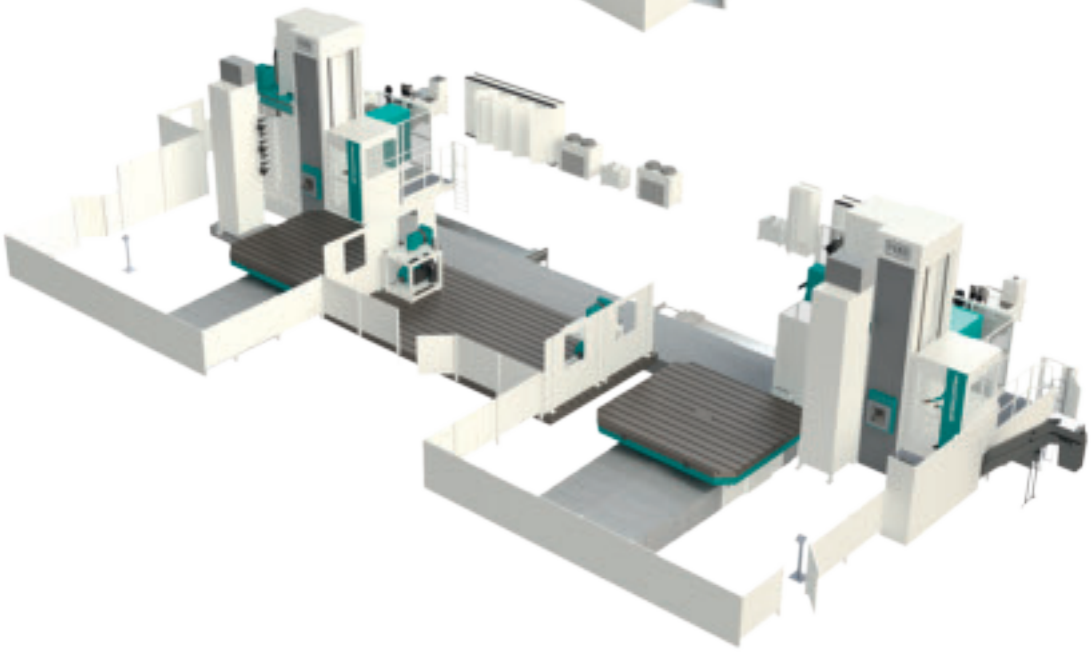
ERGONOMICS AND SAFETY

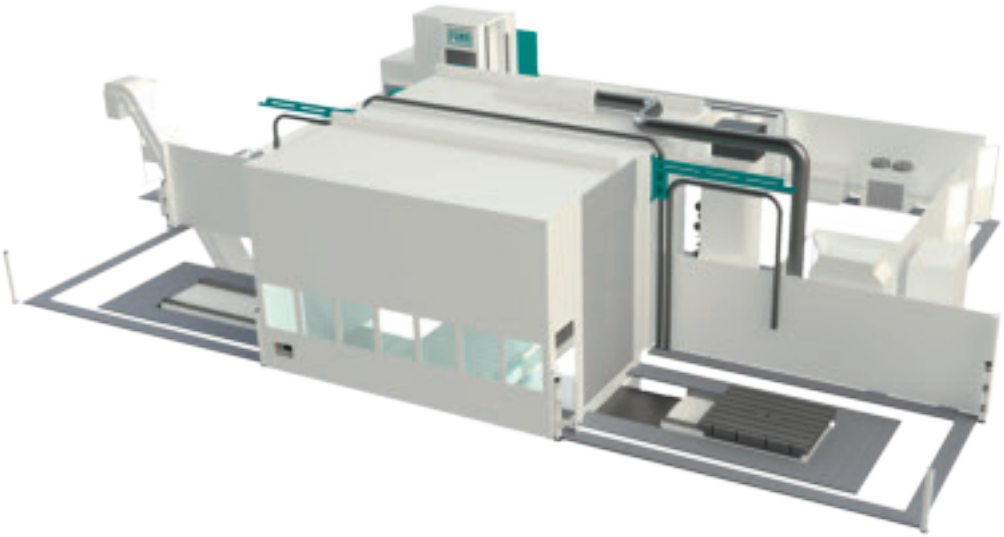
full enclosure systems are available for Speedram HP machines in order to guarantee a safe and clean working environment

Speedram HP can be equipped with a large variety of configurations. Multiple table double columns, automatic pallet changing systems or FMS shuttles.

AUTOMATION

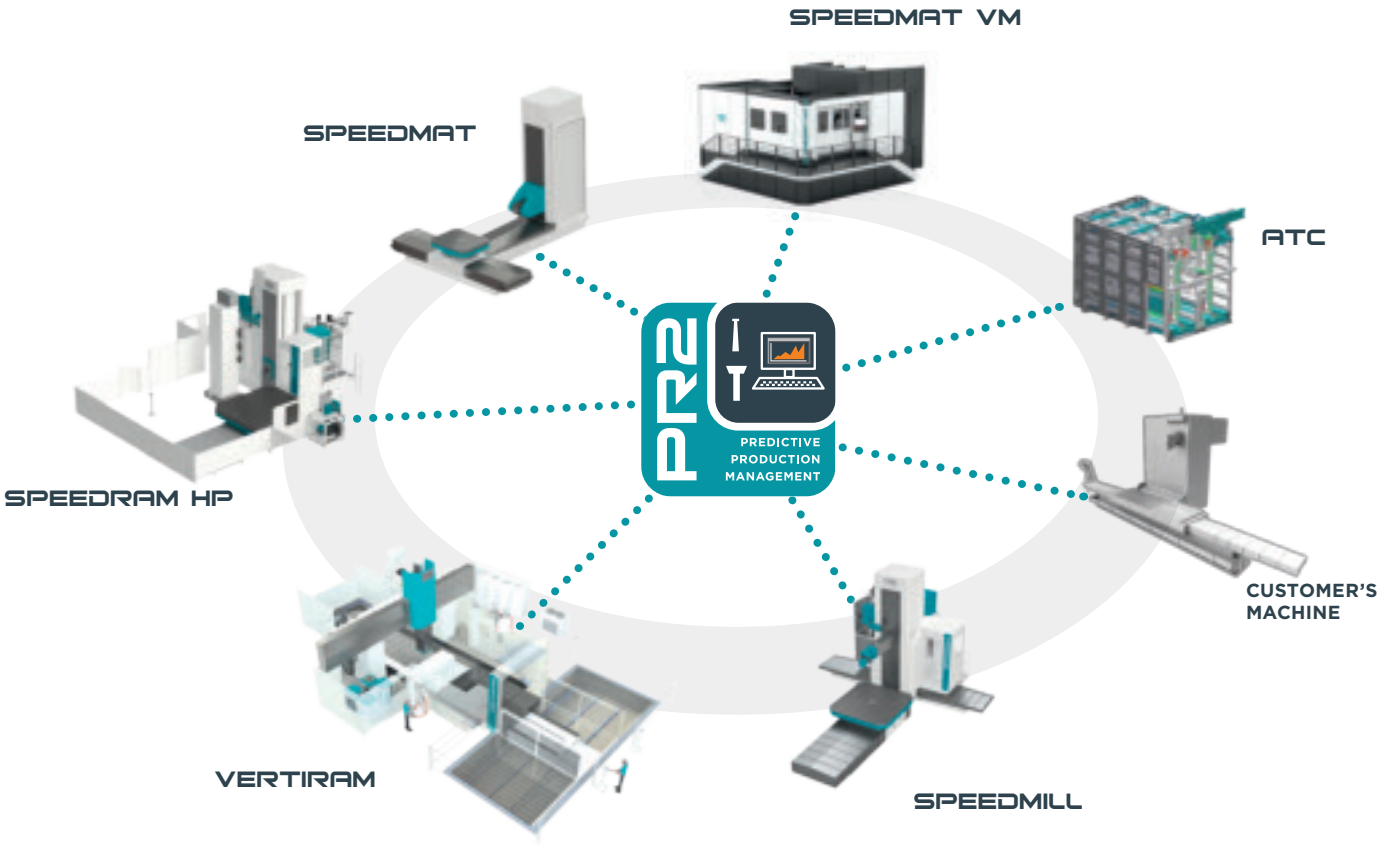






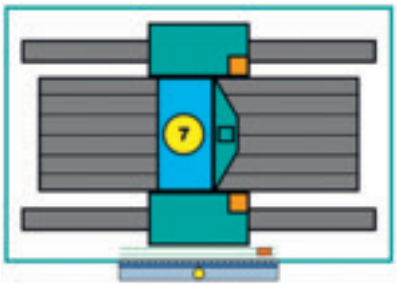
PR2 SUITE

multi-level, applications, integrated software developed by PAMA, designed to bring our clients to a higher level of efficiency and profit, thanks to our intuitive user interface, management of the production units in real time with predictive approach in both manned or unmanned conditions.



complete reporting of production unit activities

efficient managing of complex units (even with clients existing, compatible machines)



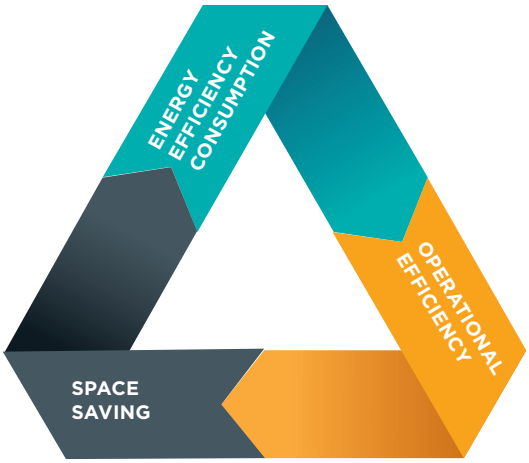
efficient managing of single production unit

PR2 (Predictive Production Management): optimize the efficiency and the saturation of the production system

PAMA GLOBAL EFFICIENCY

energy saving: low friction guides, use of direct drive technology, regenerating drives, intelligent use of all auxiliary units

space saving: compact design, wide choice of tool changer, pallet changer and chip conveyors



operational efficiency: multitasking configuration, machine reliability, PMP preventive maintenance software, MSM machine sensor monitoring and predictive maintenance, PR2 suite to optimize the efficiency and the saturation of the production system

PGE (PAMA Global Efficiency): energy saving, space saving, operational efficiency


PAMA

easy maintenance, combined with predictive maintenance, is a must for an efficient workshop management

ERGONOMICS MAINTENANCE

PMP (PAMA Maintenance Program): reminds operators and maintenance personnel of scheduled preventive maintenance activities via messages, alarm and or icons permanently displayed on the CNC screen

PMP (PAMA Maintenance Program): software system reminds operators and maintenance personnel of scheduled PM activities

MSM (Machine Sensor Monitoring): temperature and acceleration sensors for continuous machine monitoring and predictive maintenance

SPEEDRAM HP

		1000 HP	2000 HP
WORKING AREA			
X axis (column)	mm	5000	5000
	mm	+N x 1000	+N x 1000
Y axis (headstock)	mm	2000 - 5000	3000 - 7000
Z axis (ram)	mm	1200	1600
W axis (boring spindle)	mm	600	600
Z+W axes	mm	1800	2200
HEADSTOCK			
Ram section	mm	430x430	430x430
Boring spindle diameter	mm	120	120
Max spindle power (S1)	kW	66	66
Max spindle torque (S1)	Nm	1175	1175
Max spindle speed	rpm	5000	5000
Transmission		Direct Drive	Direct Drive
AXES FEED RATES			
X-Y-Z-W axes rapid traverse / feed rate	m/min	up to 30	up to 30

3000 HP	4000 HP	5000 HP	6000 HP
5000	5000	5000	5000
+N x 1000	+N x 1000	+N x 1000	+N x 1000
3000 - 7000	4000 - 10000	4000 - 10000	4000 - 10000
1600	2000	2000	2500
800 1000	800 1000	1000	1000
2400 2600	2800 3000	3000	3500
500x500	500x500	600x600	600x600
130 150 / 160	130 150 / 160	150 / 160 180	150 / 160 180
78 82	78 82	82 108	82 108
1743 2494	1743 2494	2494 3900	2494 3900
5000 4000	5000 4000	4000 3000	4000 3000
Direct Drive	Direct Drive	Direct Drive	Direct Drive
up to 25	up to 20	up to 20	up to 20

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PAMA has a policy of continuous improvement of its products and reserves the right to change materials and specifications without notice

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