

Excellence in Manufacturing



Milling-Turning Centers

**MT Technology for Perfect, Complete Machining
From the Blank Bar and Chuck**





Save Time – Cut Costs

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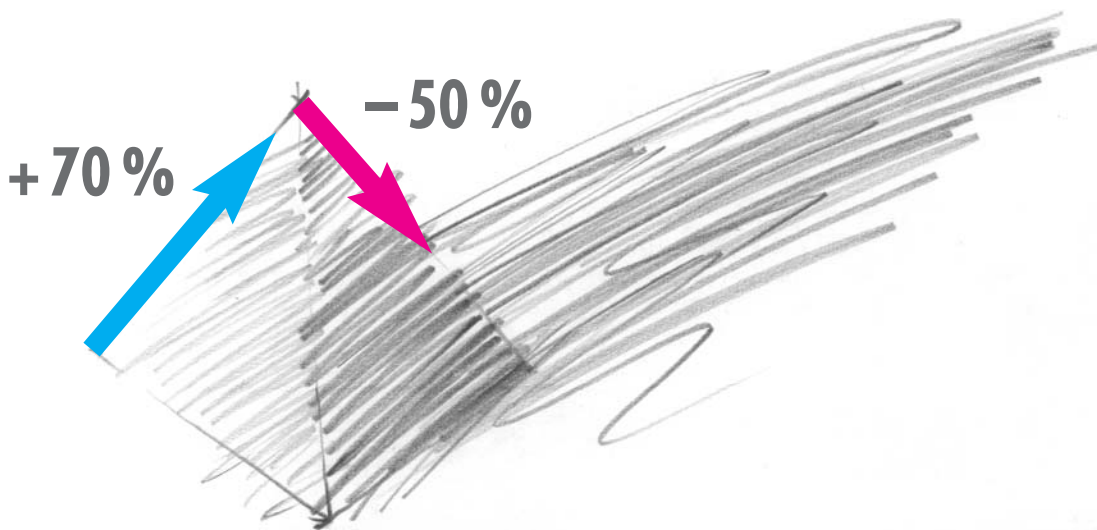
STAMA MT Technology

Top technology for high-precision and economical 6-sides complete machining – from the blank bar or chuck (semi-finished products, blanks).

We meet the daily challenges posed by the market and work of our customers with modern, innovative manufacturing solutions. Proven methods and technologies are constantly being individually redefined with great creativity, sound know-how and a high competence. This gives you an economical and reliable solution.



6-sides complete machining on one center with the technologies “milling, drilling and turning” is a development from STAMA engineering that has stood for great time savings and a drastic reduction of item costs in tool manufacture, medical technology, the automotive sector as well as hydraulics and pneumatics, for example, since the start of production in 2000.



Learn more about the main features, advantages and possibilities of the MT Technology (Milling-Turning) and STAMA milling-turning centers in your manufacture and production on the following pages.

Great Freedom for a Wide Range of Parts

All STAMA milling-turning centers are designed for the complete machining of complex, high-quality workpieces with the aim of improving precision and drastically reducing machining times and item costs. Workpieces can be a combination of both rotationally symmetric and cubic and be manufactured from the blank bar, chuck or with a device.

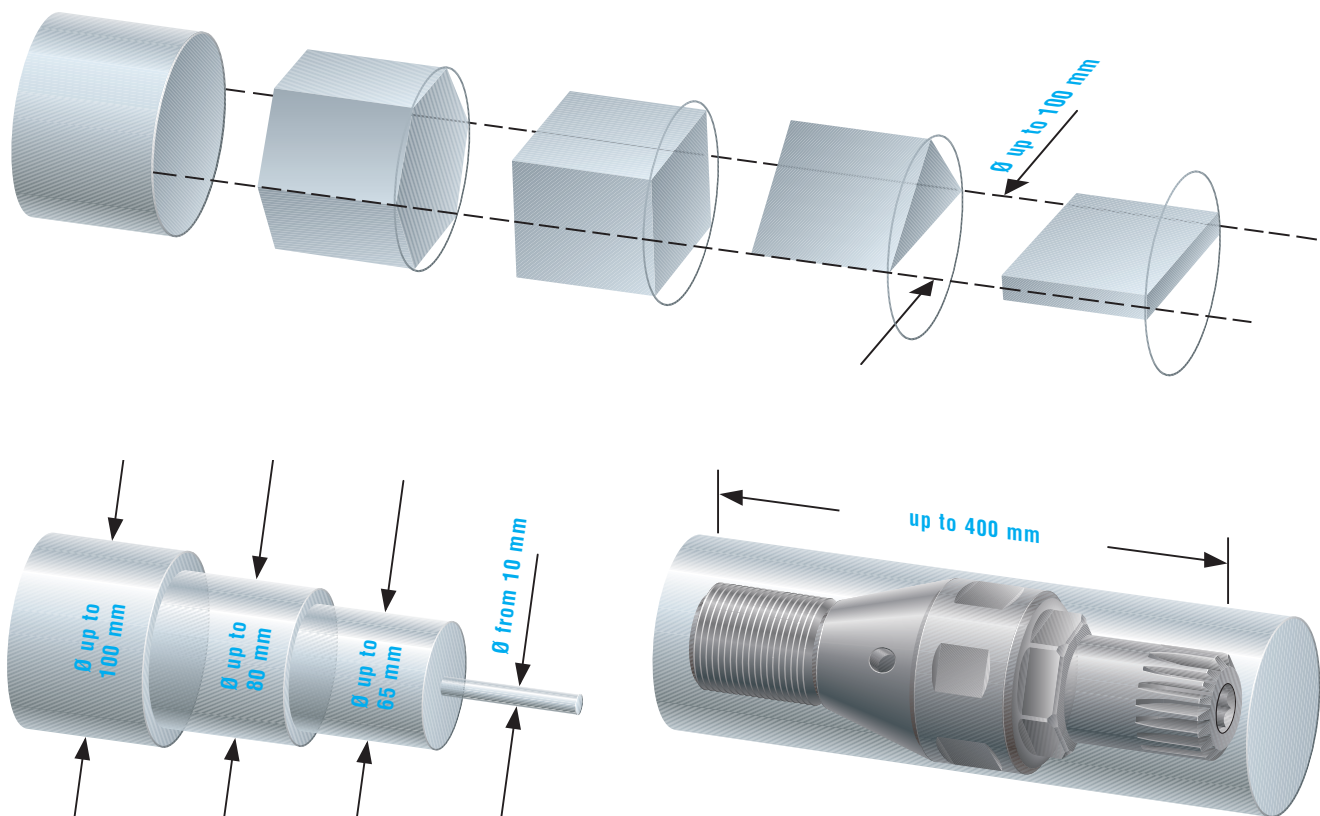
The milling-turning centers are the optimum manufacturing solution for all workpieces whose production process requires powerful milling and turning operations. An intelligent tool management with very short and constant chip-to-chip times as well as a very high capacity tool magazine form the basis for economical complete machining.

The advantages at a glance:

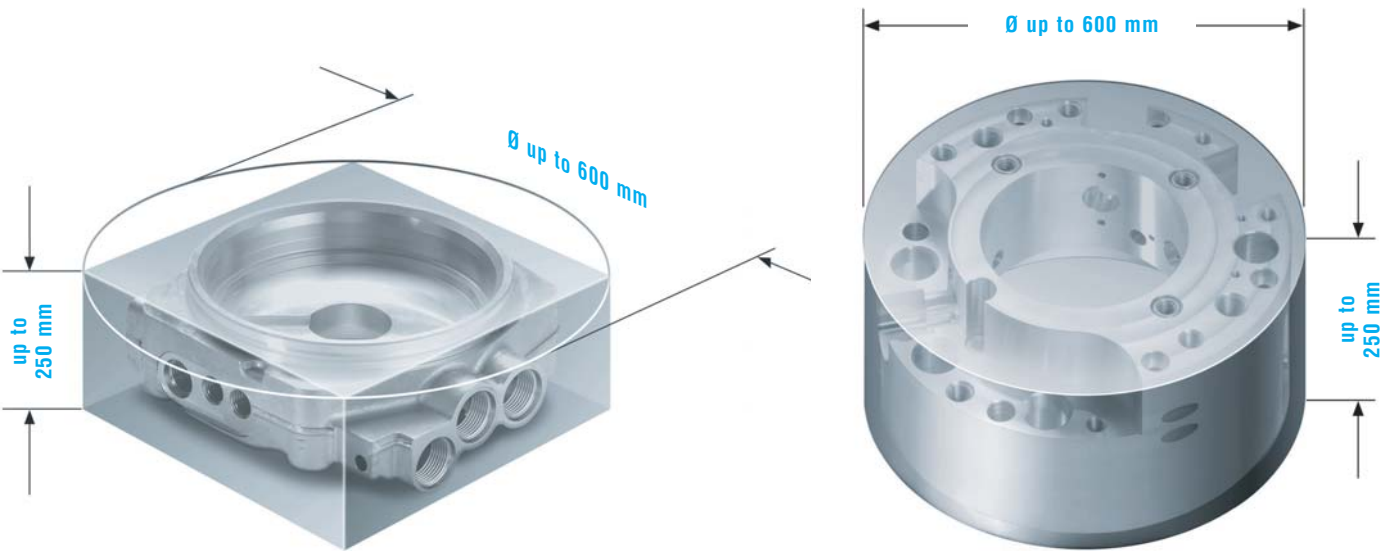
- Machining random material cross sections and materials such as titanium, steel, aluminum, gold, etc., from the blank bar or chuck
- Full turning and milling functions in one center
- Reduction of machining times by up to 70 %

- High output and generous dimensioning for heavy-duty cutting
- Long service life of milling and turning spindle
- Drastic reduction of space requirements
- Easy operation – only one controller for milling and turning
- Large standard tool magazine for a wide range of operational sequences

System 7: Bar material sizes and shapes (examples)



System 8: Chuck part sizes (semi-finished products, blanks)



Milling From the Blank Bar

7

The logical step beyond the possibilities offered by a classical vertical machining center: 5-axes milling from the blank bar for all 6 sides of your workpiece in a max. of 2 clamping positions.

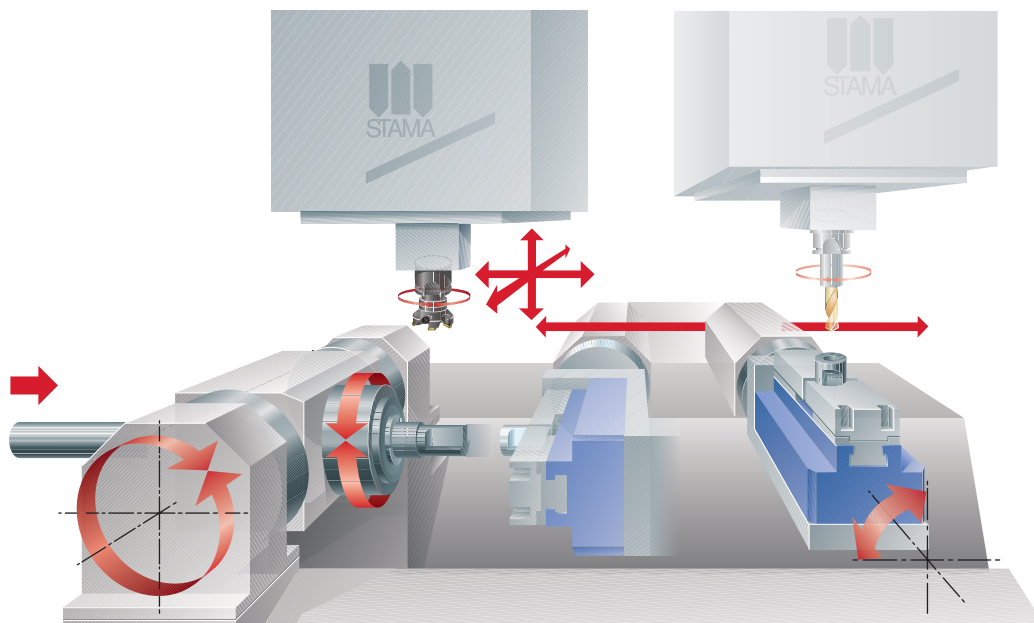
Milling from the blank bar calls for a revolutionary rethink. This manufacturing technology does away with sawing off un-machined parts, pre-milling of block-shaped blanks and the production of special devices. There are hardly any limits to the creativity of design engineers and the pursuit of more productivity and efficiency in the range up to a profile diameter of 100 mm.



Fitted with an intelligent loading, turning and swiveling unit (A- and B-NC axes with 0.001° resolution), this center model can machine certain parts from the blank bar from a batch size 1 up to a medium-sized series faster, more flexibly and more economically than before. The sturdy machine construction, powerful drives and high milling capacity combined with complete machining guarantee maximum precision and an excellent workpiece quality.

The advantages:

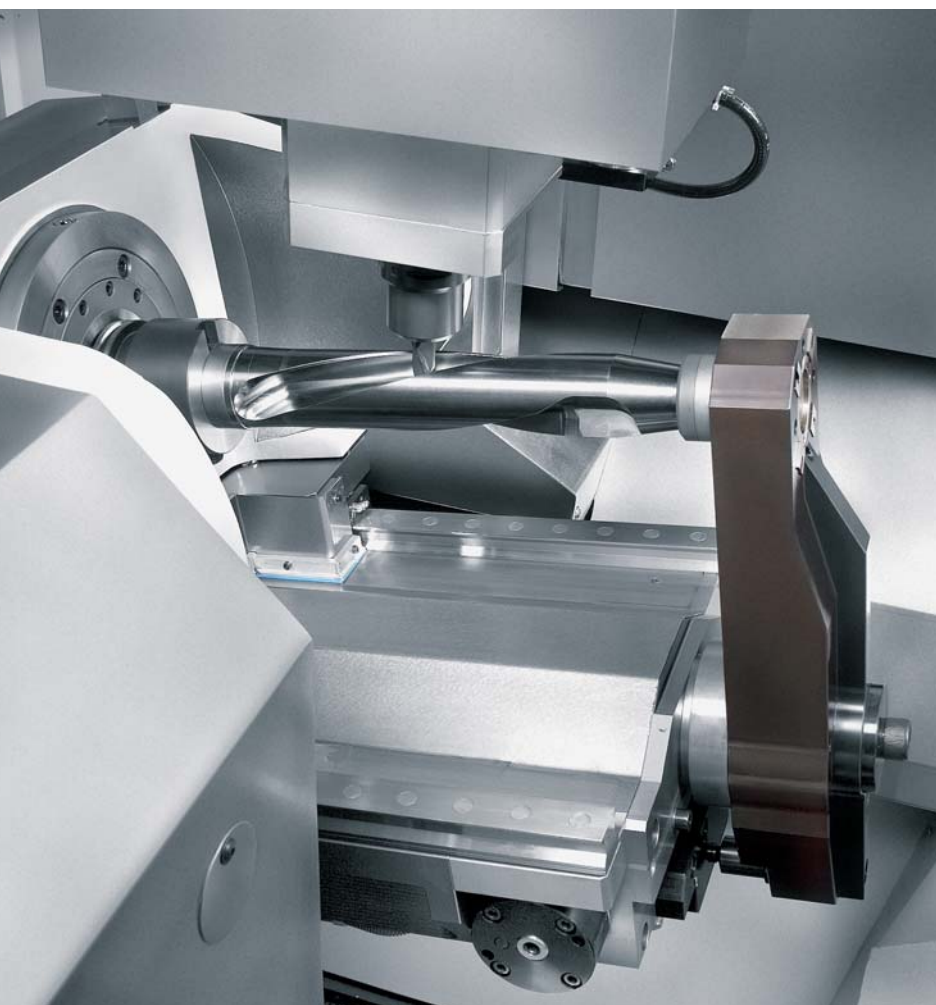
- Maximum quality through 5-axes complete machining in a max. of 2 clamping positions
- Minimum set up times through a modern chucking concept without expensive chucking devices – with only one simple chuck
- Excellent transmission of the high performance through a 4th axis borne on both sides
- Clear material flow with a high level of automation, only blank (bars) or finished products



The M Variant
System 7 for 6-sides
 milling and drilling
 from the blank bar
 with a 2-axes turning-
 swivel unit and NC
 turntable with jaw
 clamping for the
 6th side.

Machine types
 MC 726/M
 MC 734/M

The technical data can
 be found on page 22.

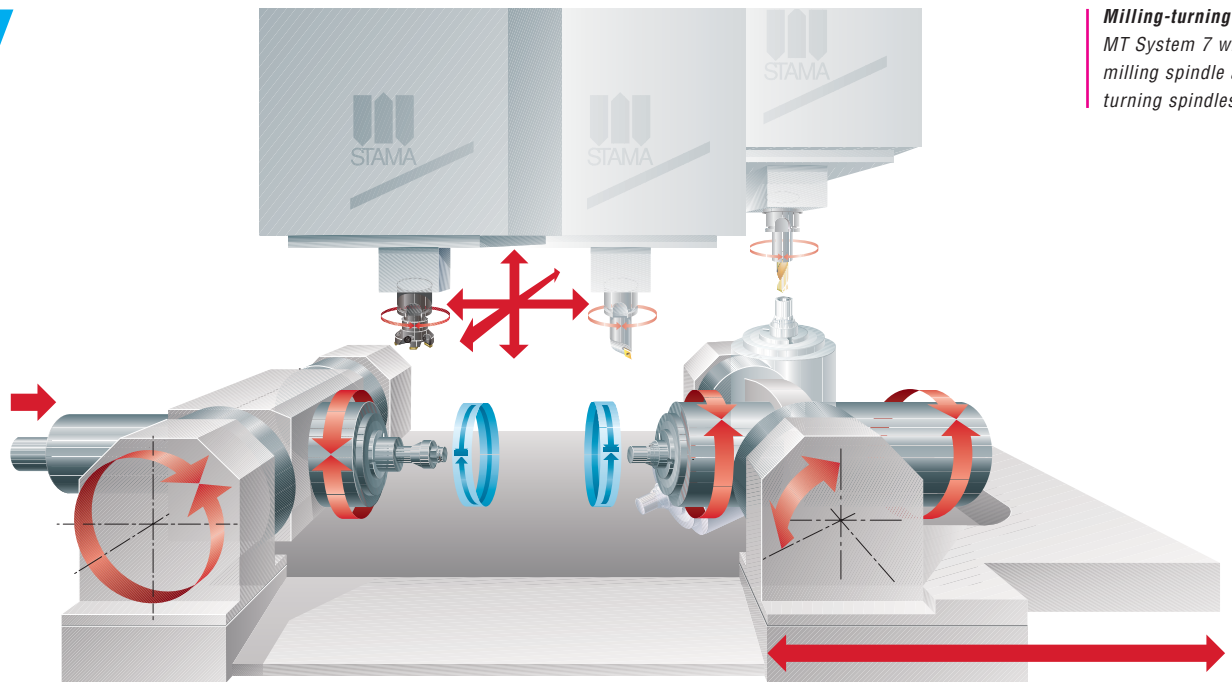


Option

The pivoted NC tailstock is
 recommended for slim
 workpieces. With this
 support there is nothing in
 the way of high-precision
 machining. It can simply
 be swivelled away to
 machine the ends.

Milling and Turning From the Blank Bar – 50 % Reduction of Item Costs

7



Milling-turning center
MT System 7 with one
milling spindle and two
turning spindles.

Swivel angle

1st turning spindle

from -30° to 90°

2nd turning spindle

from -30° to 90°

Travel ranges

X = 500/520/800 mm

Y = 380/400/520 mm

Z = 360/510 mm

Save Time – Cut Costs:

6-sides complete machining from the blank bar.

The idea is ingenious, the realization simply convincing: you can mill, drill and turn all 6 sides of your workpiece from the blank bar in a max. of 2 clamping positions on the System 7 milling-turning centers.

Programming

and NC simulation
with all common
programming systems.

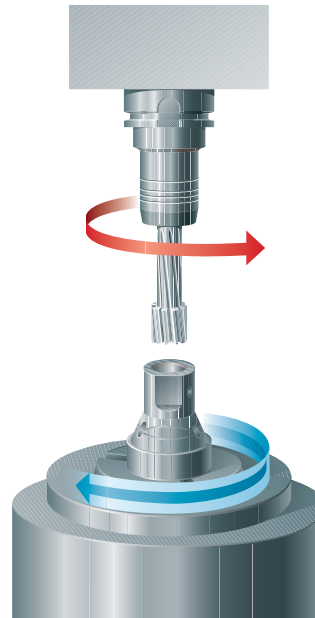
A multi-processor controller, 11 NC axes and tool magazine from 42 up to 60 plus 180 spaces allows the machining of random material cross-sections and various materials such as titanium, steel, aluminum, gold, etc.

The possibility of alternately combining milling, drilling and turning operations in any sequence allows an optimum machining procedure. For the highest quality demands and narrow tolerances.

The item costs are decisive. In every line of industry.

The functional principle of the STAMA MT center makes the fully automated manufacture of precision workpieces with complex geometries reliably safe and controllable. Here we see the clockwise and anti-clockwise rotation (contra-rotating milling and turning spindle). This feature helps you achieve perfect concentricity during drilling.

All machining tasks with a **rotating cutting edge** including milling, drilling, thread-cutting etc. as well as with a **stationary cutting edge** such as external/internal turning, grooving, etc. are performed with maximum precision and reliability.



Loading



Turning



Multi-sided milling

Further machining technologies such as grinding, lasing, etc. can be integrated at any time.



Milling



Drilling



Tapping

From Individual Parts to Small and Medium-sized Series

7

Batch size 1 - Set up time 0: a vision becomes reality!

We have been pursuing this goal for our milling-turning centers since 2000 and have been realizing it every single day since then in connection with 6-sides complete machining from the blank bar.

*Read more
on the German
Internet website at
mt-technologie.de
in the menu
"Wissenstransfer/
Anwenderreportagen".*

Because it is the best way to describe one of the tasks that fully exploits the potential of the STAMA MT centers.

Here an example of an application from Switzerland:

a customer decides to once again manufacture precision parts themselves (insourcing). The reason:
he practices the

"Batch size 1 – Set up time 0" principle with two MC 726/MT milling-turning centers. This allows him to first manufacture one workpiece of the type A, followed by 12 workpieces of the type B with no re-set up and then a small series of 70 parts of the type C overnight, fully automated in the 3rd shift.

The cost reductions compared to the formerly purchased workpieces are on average 60 %. And: the know-how for this complex manufacturing is once again within the company.

**STAMA MT technology – the optimum
manufacturing solution.**





Work area MC 734/MT
with powered tailstock
center and counter-
spindle with chuck
or jaw chuck.

The version with tailstock center and counter-spindle allows maximum flexibility and stable cutting conditions for all workpieces. Once the powered tailstock center has been swivelled away the workpiece is taken up by the counter-spindle and the necessary operations completed on the 6th side.

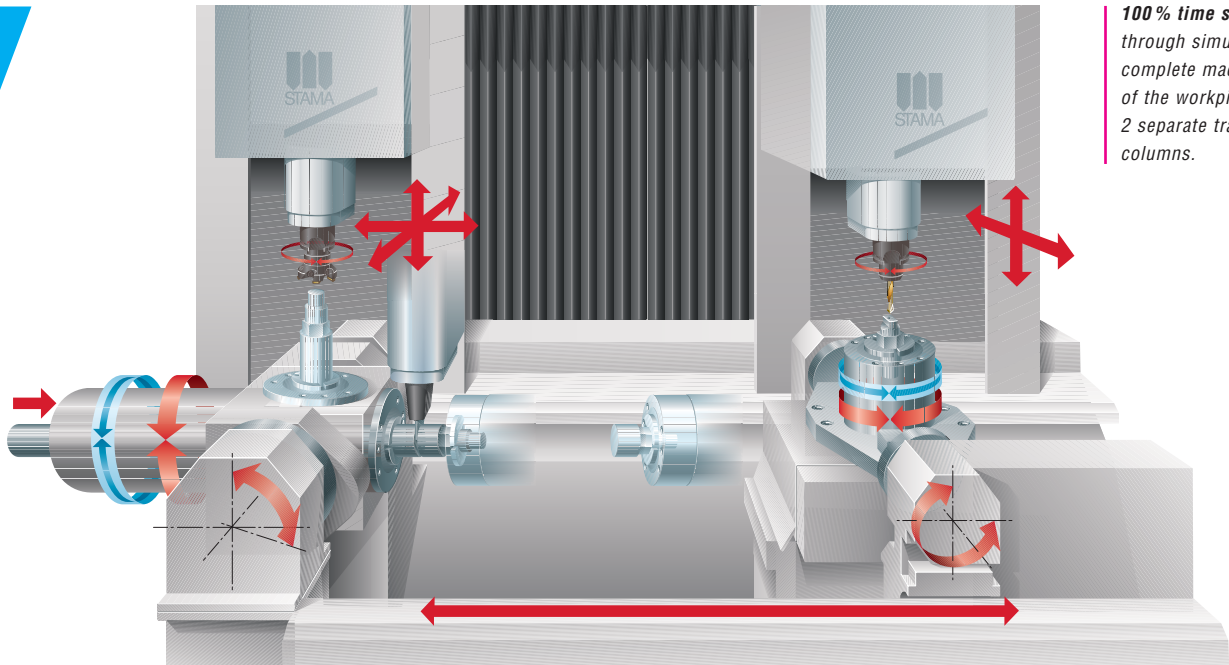


Machine types
MC 726/MT
MC 734/MT

The technical data can
be found on page 22.

High Productivity and Precision for Medium to Large Series

7



100 % time savings through simultaneous complete machining of the workpiece with 2 separate traveling columns.

Top quality for highly productive complete machining in large series.

Manufacturers of large series and mass-produced articles (**batch sizes 1000–1000000**) can now mill, drill and turn their workpieces on all 6 sides in a max. of 2 clamping positions on only one center. High productivity, high efficiency and perfect quality.

The milling-turning center has two independent traveling columns on a common machine bed. Each traveling column is a separate system with a powerful milling spindle, large standard tool magazine and turning-swivel unit with integrated turning spindle for various configurations.

The automatic raw material transport out of the raw material store from the first to the second working position, reliable programming with no interfering contours in the work areas, user-friendly set up and only one modern multiprocessor control for all milling and turning operations on both systems are further highlights of this perfect manufacturing system.

Machining on traveling column 1
5-sides complete machining with milling, drilling and turning in one chucking operation.



Workpiece transfer
After cropping the workpiece the 2nd turning spindle moves to its position below the 2nd traveling column.

Parallel to these operations the 1st traveling column performs the 5-sides machining of the next workpiece.

Workpiece handover
The turning spindle swivels around 90° after machining the 5 sides. The workpiece is taken up by the 2nd turning/swivel unit and cropped from the milling spindle.

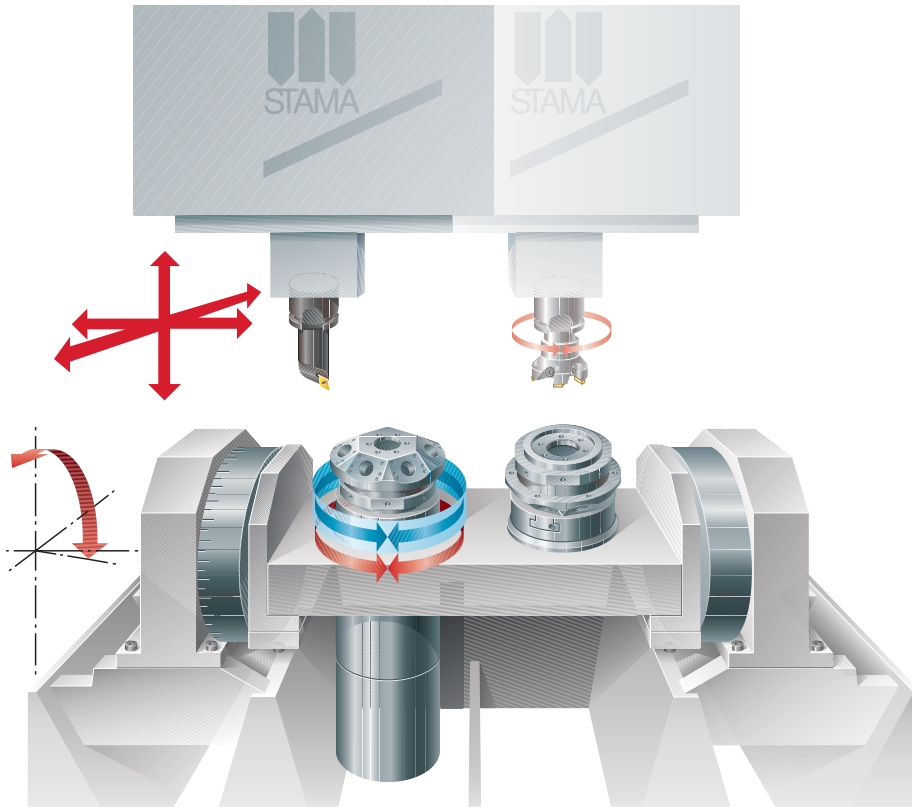


5-sides machining of the 2nd workpiece on traveling column 2
The necessary milling, drilling and turning operations of the 2nd chucking operation are carried out with the milling spindle and turning/swivel unit with integrated turning spindle (swivel angle of 270°) and the finished workpiece ejected on a conveyor belt.



Milling and Turning From the Chuck – Highly Dynamic and no Storage Times

8



MC 834/MT milling-turning center with one milling and one turning spindle plus an additional clamping station in the swing bridge for machining the 6th side.

**Whether saw sections, semi-finished products or cast blanks:
perfect 6-sides complete machining from the chuck and device.**

Machine types
MC 826/MT
MC 826/MT-TWIN
MC 834/MT
MC 834/MT-TWIN

The perfect possibility for the complete machining of large and heavy workpieces (e.g. Ø up to 600 mm), low space requirements thanks to its compact design and the fact that no semi-finished products have to be stored make this system so attractive.

When machining workpieces from the chuck you will be convinced by the fact that you can perform the complete machining of workpieces on all 6 sides with only one center. This improves the quality, saves space, reduces machining and storage times and the item costs accordingly.

After all, item costs are and will remain decisive. In every line of industry.



Integrated shuttle-automation to exchange various chucks and to feed and remove blanks and finished workpieces.

The drastic reduction of machining and storage times avoids often ignored logistics costs.

The fields of use of the System 8 MT centers range from the automotive industry, hydraulics, fittings, agricultural machinery, printing press manufacturers and mechanical engineering through to the production of large and heavy bearing housings.



1 milling and 1 turning spindle



1 milling and 2 turning spindles



2 milling and 2 turning spindles

Various System 8 models

MT: one-place center with 1 milling spindle and 1 or 2 turning spindles.

MT-TWIN: one-place or two-place center with 2 milling and 2 or 4 turning spindles.

The technical data can be found on page 23.



From Individual Parts to Medium and Large Series

8



MC 834/MT milling- turning center

*Designed for the
5-axes complete
machining of
individual parts
and small series.*

*Low space require-
ments, great stability
and high dynamics –
ideal preconditions
for the high-precision
machining of steel and
cast parts.*

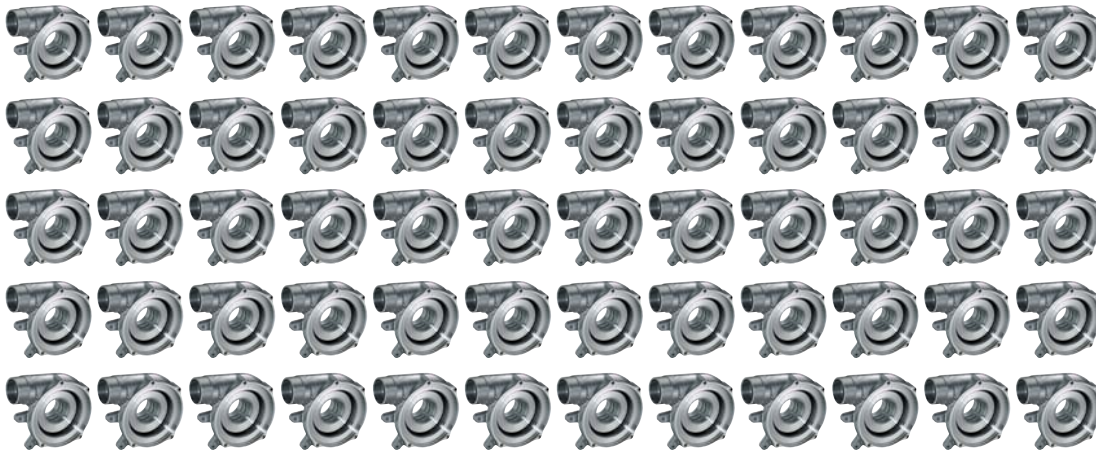


**As a one-place or
two-place center**
*you can choose any
machining sequence
for the milling and
turning operations
with both MT versions.*

*Simple, reliable pro-
gramming – no inter-
fering contours in the
work area and only one
multi-processor con-
troller for all milling,
drilling and turning
operations.*

**Thanks to the modular principle behind the System 8 milling-turning centers
you will find the optimum manufacturing solution for every task and batch size.**

The new dimension in 5-axes machining with
milling, drilling and turning on a System 8 center
guarantees a high quality. This does away with
follow-on processes such as heat treatment and
grinding during hard machining.



**Complete machining
in large series**
an MC 826/MT TWIN
center has been config-
ured as a two-place
version for this work-
piece (turbocharger).

5 sides are milled and
turned in the 1st work
area.

The 4-axes complete
machining of the 2nd
chucking operation
is carried out with
2 spindles in the
2nd work area.

Which version of the System 8 series matches your
workpieces? We can carry out corresponding trial
machining according to your drawings and specifica-
tions. An item time and cost analysis then shows
you whether and which manufacturing solution is
best for you with MT technology.



Top Class Spindles

The heart of the spindle: after a concentricity check of the spindle shaft and ultra-fine balancing, the bearing packages are assembled in a climatized clean room. The concentricity and balance check is repeated after installation of the con-rod and 500 load changes for the spring assembly. The final check of the fully assembled spindle is concluded with a 10-hour endurance test at maximum speed.

25 employees work in spindle manufacture and pre-assembly, producing around 800 milling spindles with the tool adapters HSK-A63/100, ISO 40/50 and Capto C5/C6 for the four different classes of the STAMA centers each year.

Machining spindles are manufactured with internal minimum lubrication or an internal coolant supply for pressures up to 120 bar in batch sizes between 5 and 10.



All turning spindles are designed as liquid-cooled motor spindles with synchronous technology. This allows maximum performance in a small space with a high thermal stability.

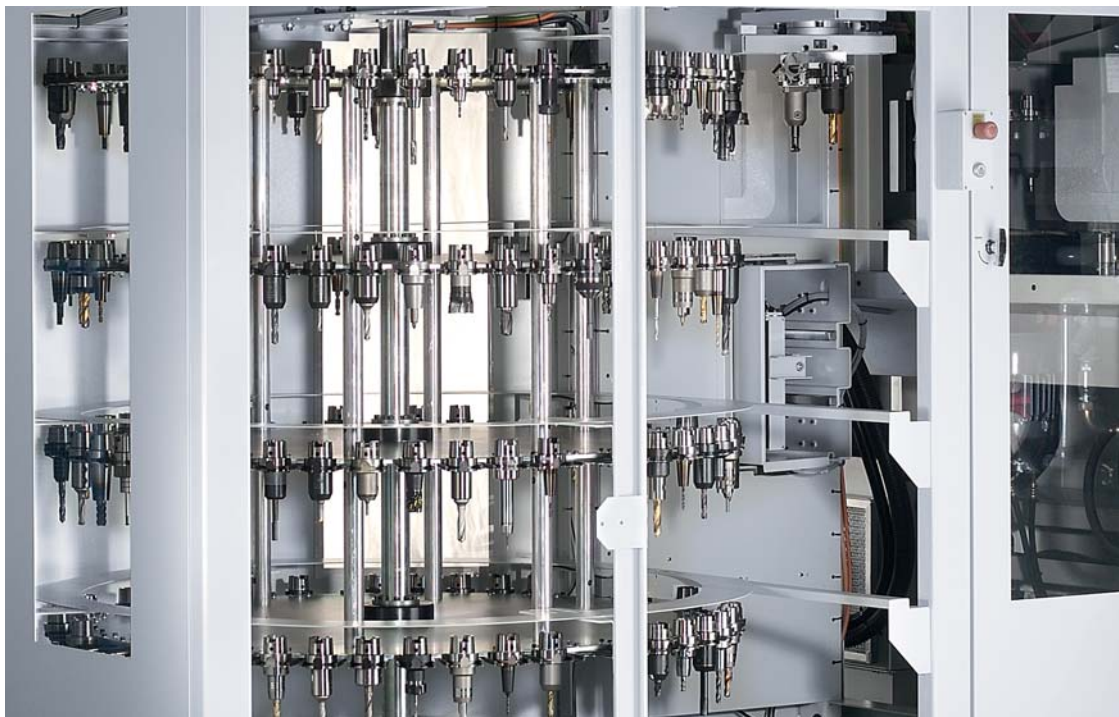


STAMA – Excellence in Manufacturing

Intelligent Tool Management^{Pat}

The large standard tool magazines are outside the chip and coolant area. The tool itself is changed by a pick-up method over the spindle head.

A comfortable changing station with its own terminal to enter all necessary tool data reduces the set up time.



Tool magazine data

Patented tool management for constantly short chip-to-chip times.

42–120 tool places for tool adapters HSK-A63, ISO 40 or Capto C5.

Tool weight up to 10 kg.

Internal coolant supply with programmable pressures.

External set up magazine
with up to 180 spaces
for background loading
parallel to main time.



The buffer station

Process-controlled supply of tools for constantly short chip-to-chip times.

STAMA Software-Tools – the Plus for Even More Availability

Process reliability and availability are not just a question of perfectly working hardware but today, more than ever before, of electronic intelligence.

Interference Check, Home Positioning Procedure, Variable Clamping, Feed Control, Event Monitoring and NC Simulation are innovative software tools that significantly improve the process quality and productivity and thus make an important contribution to much lower item costs.



*Controllers for
the System 7
Siemens 840D
FANUC 31iMA/5*

Automatic NC program change (STAMA job list).

Up to 200 different workpieces (individual parts or various batch sizes) can be pre-selected via CNC.

The controller checks the capacity of the tool magazine for all programs and automatically processes the relevant NC programs with the pre-set number of items.

Availability is also decisive for item costs.

STAMA Services

Service stations and spare parts stores worldwide (over 70 stations).



*An overview of
the services*
Workshops
Consulting and sales
General training
Maintenance training
Production consulting
Service – 24 h
on-call service



Further services:

service training, tuning packages for hardware and software,
service contracts, etc. Find out more.

Turnkey Solutions with MT Technology

*Customer
Task
Idea
Concept
development
Offer*



Standalone production islands matched to an optimum production for the relevant machining task are one of the strengths of STAMA engineering. And as soon as we know you, your production and the job in hand, we suggest the appropriate center or a turnkey solution.

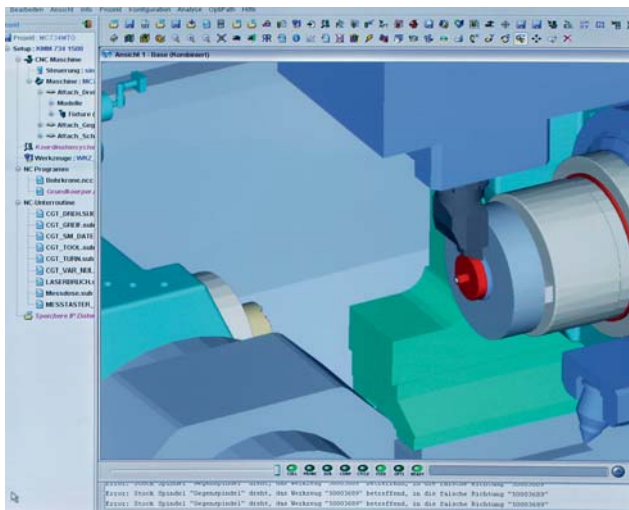


The decision is based on the results of item cost calculations, cycle time analyses, tolerance chains, process cost analyses and of course our many years of practical experience.

From this moment on it is like an “All-inclusive, no worries package” for you. This contains the complete process technology, trial machining, NC program simulation, pilot lot production, production consulting and process optimization.

From the blank to the finished part – a one-stop supplier.

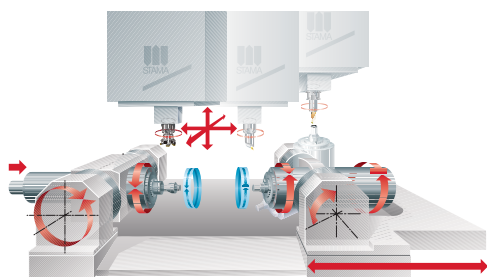
Design, manufacture, assembly, chuck and tool technology, workpiece handling, production control, statistical process acceptance, hardware, software, peripherals – everything is in the best of hands with us.



NC Simulation
Safety package to detect and eliminate any programming errors.

Turnkey solution on the basis of the MC 726/MT milling-turning center
In addition to the automatic bar loader, integrated handling system via portal loader for cast blanks and rough forgings

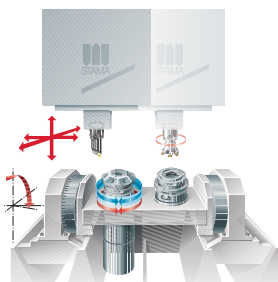




Technical Data Table

System 7

Description		MC 726/M	MC 734/M	MC 726/MT	MC 734/MT	MC 726/MT-2C
Milling spindle(s)						
Spindle drive	kW	18.5/37	37/60	30/37	37/60	2 x 30/37
Torque	Nm	60/140	140/200	100/140	140/200	2 x 100/140
Spindle speeds	r.p.m.	10500/12000/ 15000/20000	10500/12000	10500/12000/ 15000	12000	10500/12000/ 15000
Turning spindle(s)						
Spindle drive	kW	–	–	42	50	2 x 42/2 x 50
Torque	Nm	–	–	120	180	2 x 100/2 x 180
Spindle speeds	r.p.m.	–	–	4000/5000	4200	5000/4200
Interfaces		BZI 65	BZI 80/BZI 100	BZI 65	DIN 55026 A8	BZI 65/DIN 55026 A8
Clamped torque						
Swivel axis	Nm	1400				2 x 1400
Pivot	Nm	3500				
Working ranges						
Travel range X	mm	520	800	500	800	2 x 500
Travel range Y	mm	400	520	380	520	2 x 400
Travel range Z	mm	360	510	360	510	2 x 360
High speeds X/Y/Z	m/min	60				
Axial acceleration	g	up to 1.2	up to 1	up to 1.2	up to 1	up to 1.2
Tool magazine						
Tool places		42/60	64	42/60	64	2 x 42
Tool adapter		ISO 40/HSK-A63		HSK-A63		
Tool weight	kg	5/10				
Tool Ø	mm	88/125	78/160	88/125	78/160	88/125
Tool length	mm	250	300	250	300	250
Chip-to-chip time*	sec.	2.1	2.9	2.1	2.9	2.1
Set up magazine	places	90/180				145
Workpiece size						
<u>Bar machining</u>		up to 48 m material				up to 60 m material
Bar length	mm	up to 800				up to 1000
Bar Ø	mm	15–65	15–80 (95)	15–65	15–80 (102)	15–65 (102)
Workpiece length	mm	120/240	400	120/240	300	240
Machining from chuck						
Workpiece length	mm	–	400	–	300	
Workpiece Ø	mm	–	400	–	300	
Workpiece weight	kg	–	50	–	50	
Machine data						
Height	mm	3250	3400	3250	3400	3515
Width x depth	mm²	3900 x 3440	4500 x 4250	3900 x 3440	4500 x 4250	7360 x 2915
Weight	kg	6300	9200	6600	10200	16000
Control						
Multiprocessor CNC		Siemens 840D or FANUC 31iMA/5				
		*depends on control				



Technical Data Table

System 8

Description		MC 826/MT	MC 834/MT	MC 826/MT-TWIN	MC 834/MT-TWIN
Milling spindle(s)					
Spindle drive	kW	30/37	37/60	2 x 37	2 x 37/60
Torque	Nm	140	140/200	2 x 140	2 x 140/200
Number of spindles		1	1	2	2
Spindle distance	mm	–	–	320	320/400
Spindle speeds	r.p.m.	10500/12000/15000	10500/12000	12000	
Turning spindle(s)					
Spindle drive	kW	50		2 x 50	
Torque	Nm	180		2 x 180	
Spindle speed	r.p.m.	4200			
Interfaces		DIN 55026 A8			
Clamped torque					
Swivel axis	Nm	1400		2 x 1400	
Pivot	Nm	5000			
Working ranges					
Travel range X	mm	780	800	780/2 x 570	800/2 x 750
Travel range Y	mm	380	520	380	520
Travel range Z	mm	360	510	360	510
High speeds X/Y/Z	m/min	60			
Axial acceleration	g	up to 1.2	up to 1	up to 1.2	up to 1
Tool magazine					
Tool places		42/60	64	42/60	64
Tool adapter		HSK-A63			
Tool weight	kg	5/10			
Tool Ø	mm	88/125	78/160	88/125	78/160
Tool length	mm	250	300	250	300
Chip-to-chip time*	sec.	2.1	2.9	2.1	2.9
Set up magazine	places	90/180			
Workpiece size					
Workpiece length	mm	160	250	160	250
Workpiece Ø	mm	250	600	250	250/350
Workpiece weight	kg	50			
Machine data					
Height	mm	3200	3400	3200	3400
Width x depth	mm²	3300 x 3700		3300/5200 x 3700	
Weight	kg	8500	9600	8800/11500	9900/15500
Control					
Multiprocessor CNC		Siemens 840D or FANUC 31iMA/5			
		* depends on control			

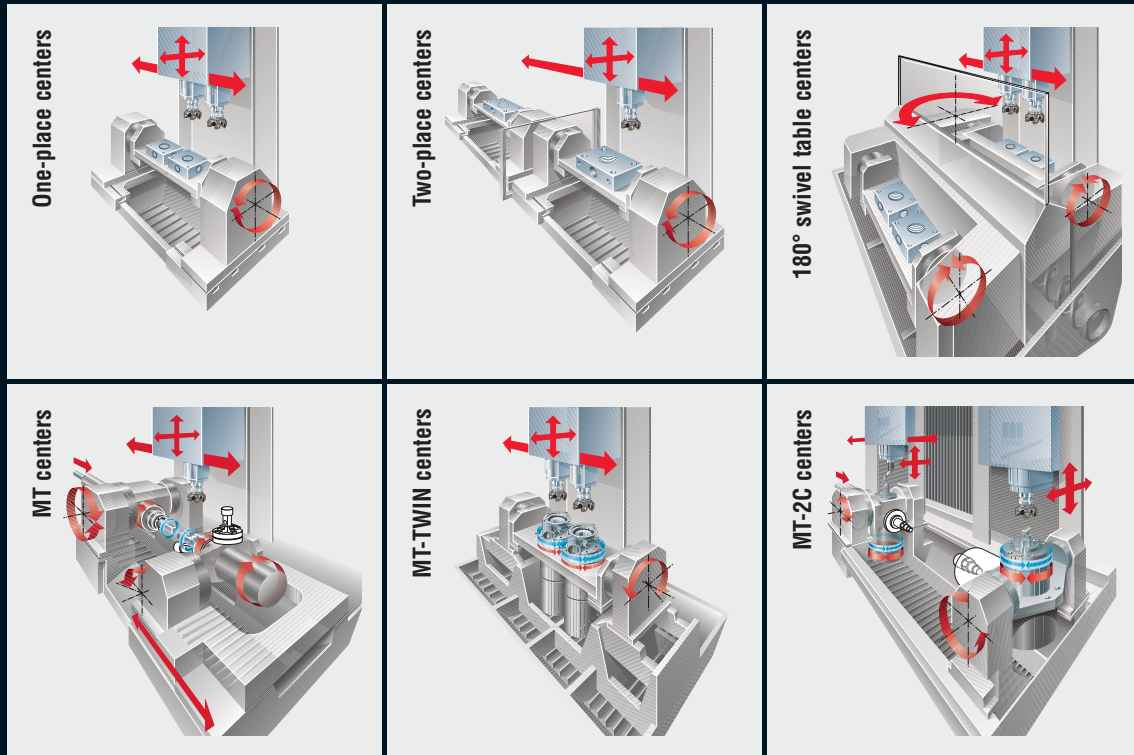
Subject to technical changes. Last revised 09/2007



www.mt-technologie.com



The STAMA Range



STAMA top technology – machining centers, devices, process technology, workpiece handling, quality assurance, advice, training and service – a one-stop supplier.

STAMA – Excellence in Manufacturing