INTEGRATED MANUFACTURING SOLUTIONS

TANK.G

HORIZONTAL 4/5-AXIS MACHINING CENTER

AVVISO
SIEMENS

TANK.G

HORIZONTAL 4/5-AXIS MACHINING CENTER

Based on the experience and features from the TANK horizontal machining centers, the product range has been further expanded with the even more flexible TANK.G models, featuring a wide choice in terms of axes stroke, machining volume, pallet size, spindles and the possibility for different types of head configuration: horizontal or tilting, transmission with double worn screw or torque motors.
These TANK.G machining centers have found widespread application in the Aerospace, Energy Oil & Gas and General Precision Mechanics sectors.

Dynamic performance:

- Unparalleled performance on all types of materials
- Excellent chip removal capabilities
- Perfect homogeneity and accuracy throughout the entire machining volume
- High ridigity of the column-head assembly

High accuracy:

- Nanometric axes management
- Automatic compensation with direct control of thermal deformation
- High geometric accuracy ensured by more than 200 hours of scraping

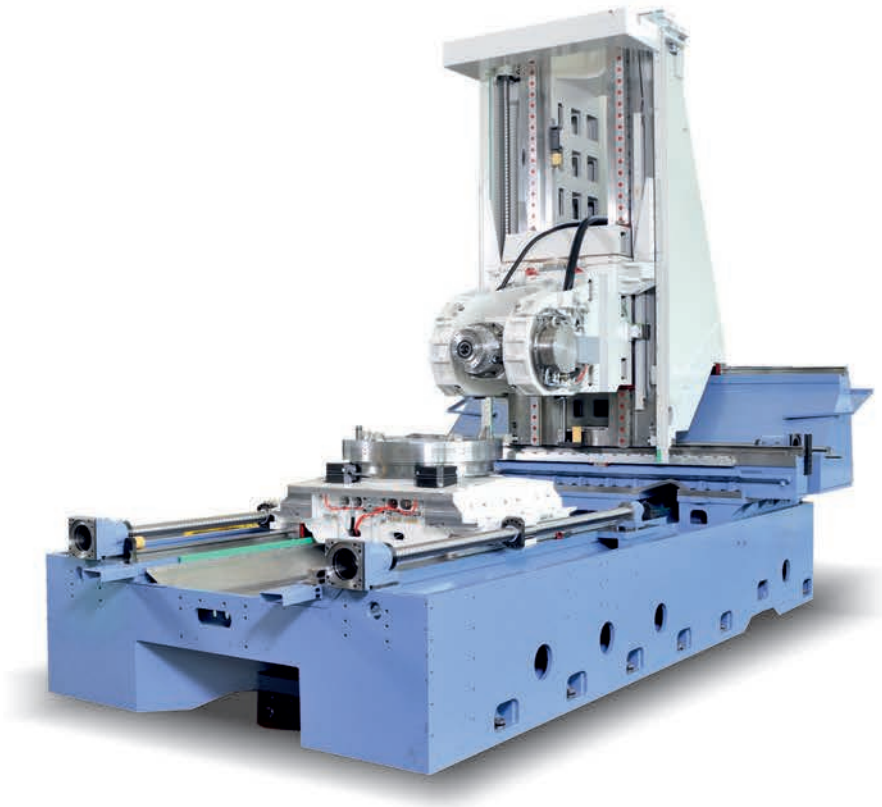
Extreme rigidity:

- The X-axis guideways assembled on two different levels create an inclined angle that greatly increases the ridigity of the column-head assembly

- Reduced thermal transience thanks to:
  - the symmetrical machine structure guarantees stability throughout every machining operation
  - the insulation of the heat sources prevents heat transfer to the structural parts

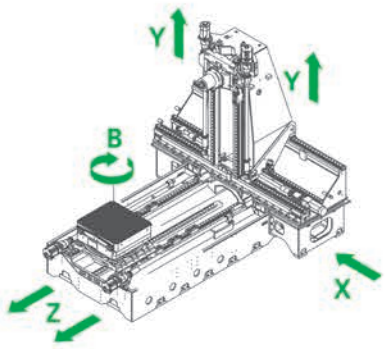
Hyperstatic structure:

- Structural and dynamic rigidity guaranteed by the principles of hyperstaticity
- Moving components assembled with extreme accuracy.



Tank.G 4AX_H

4 Axis Horizontal Milling



WORK AREA

		Tank.G 4AX_H_2000
X-axis stroke	mm	2.000
Y-axis stroke	mm	2.000
Z-axis stroke	mm	2.000
X/Y/Z axes thrust	daN	3.000
X/Y/Z rapid feed speed	m/min	45
X/Y/Z axis acceleration	m/s^2	3

PALLET

Pallet dimensions	mm	1.000x1.000 / 1.000x1.250 / 1.250x1.250
Maximum fixture height	mm	2.000
Maximum fixture rotation diameter	mm	2.200
Maximum fixture dimensions	mm	2.200x2.000

ROTARY TABLE

Maximum rotation speed	RPM	20 Torque Motor
Maximum load allowed on pallet	kg	5.000
Minimum resolution	degrees	0,0001

COMMON DATA FOR ALL AXIS CONFIGURATIONS

ACCURACY (as for ISO 230-2 standards)

Accuracy of positioning - linear axis (A)	µm	5
Sistematic positional deviation - linear axis (M)	µm	3
Repeatability - linear axis (R)	µm	4
Accuracy of positioning - circular axis (A)	arc sec	4
Sistematic positional deviation - circular axis (M)	arc sec	2
Repeatability - circular axis (R)	arc sec	3

SPINDLE

Tool-taper		HSK 100 / ISO 50 / HSK 63
Maximum speed	RPM	from 6.000 to 30.000
Maximum power	kW	up to 130
Maximum torque	Nm	up to 1.430
Accessories included		Variable preloading bearings

Tank.G 4AX_H

Tank.G 4AX_H_2600	Tank.G 4AX_H_3000
2.600	3.000
2.000	2.500
2.000	2.500
3.000	3.000
40	40-40-32
3	3
1.000x1.000 / 1.000x1.250 / 1.250x1.250	1.250x1.600
2.000	2.500
3.000	3.000
3.000x2.000	3.000x2.400
20 Torque Motor	8 (worm-screw transmission) 15 (Torque Motor transmission - Option)
5.000	8.000
0,0001	0,0001

COMMON DATA FOR ALL AXIS CONFIGURATIONS

TOOL-MAGAZINE

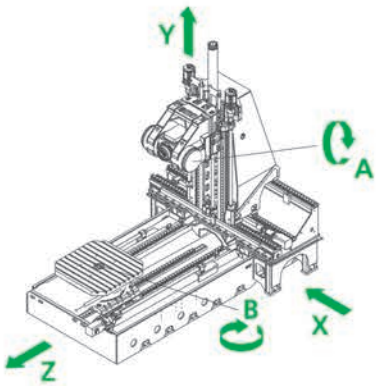
Type		Modular rack with tool movement system and exchange arm
Tool-taper		HSK 100 / ISO 50 / HSK 63
Number of tools (standard version)		80 / 199
Number of tools (option - up to)		399 - 599 - 999
Tool mass	kg	35 (HSK 63 15)
Maximum length	mm	600 / 700 (HSK 63 350)
Maximum diameter	mm	325 (HSK 63 200)
Tool changing time	sec	2.5 (HSK 100) / 3.0 (ISO 50)

COOLANT TREATMENT UNIT (BASIC VERSION)

Chip conveyor type			Scraping type
Total tank capacity		litres	1.500
Filter type			Self-cleaning (40 microns)
Standard low pressure system	Flow rate	litres/min	300 / 400 (to be divided into the various machine functions)
	Pressure	bar	2
	Piece washing with nozzles		300/400 litres/min (250 microns)
Standard high pressure system	Flow rate	litres/min	28 / 40
	Pressure	bar	20 / 80

Tank.G 5AX_TH

5 Axis Tilting Head
Milling



WORK AREA

		Tank.G 5AX_TH_1600
X-axis stroke	mm	1.600
Y-axis stroke	mm	1.500
Z-axis stroke	mm	1.850 - 2.000
X/Y/Z axes thrust	daN	2.000
X/Y/Z rapid feed speed	m/min	50
X/Y/Z axis acceleration	m/s^2	3

PALLET

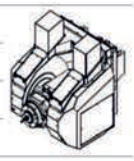
Pallet dimensions	mm	800x1.000 / 1.000x1.000 1.000x1.250 / 1.250x1.250
Maximum fixture height	mm	1.500
Maximum fixture rotation diameter	mm	2.000
Maximum fixture dimensions	mm	2.000x1.600 (TBD according to automation solution)

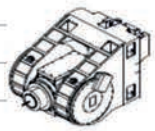
ROTARY TABLE

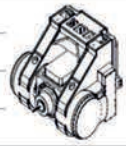
Maximum rotation speed	RPM	20 Torque Motor
Maximum load allowed on pallet	kg	5.000
Minimum resolution	degrees	0,0001

TILTING HEAD UNIT

OPTION 1 - WORM-SCREW TRANSMISSION		
Rapid rotation speed	RPM	20
A-axis tilting angle (standard version)	degrees	175 (+80 / -95)
Maximum torque (standard version)	Nm	8.700
Minimum resolution	degrees	0,0001
OPTION 2 - TORQUE MOTOR TRANSMISSION		
Rapid rotation speed	RPM	40
A-axis tilting angle (standard version)	degrees	175 (+80 / -95)
Maximum torque (standard version)	Nm	3.600
Minimum resolution	degrees	0,0001
OPTION 3 - TORQUE MOTOR TRANSMISSION		
Rapid rotation speed	RPM	35
A-axis tilting angle (standard version)	degrees	175 (+80 / -95)
Maximum torque (standard version)	Nm	10.000
Minimum resolution	degrees	0,0001







Tank.G 5AX_TH

Tank.G 5AX_TH_2000	Tank.G 5AX_TH_2600	Tank.G 5AX_TH_3000
2.000	2.600	3.000
1.700	1.700	2.500
2.000	2.000	2.500
3.000	3.000	3.000
45	40	40-40-32
3	3	3
800x1.000 / 1.000x1.000 1.250x1.250 // d.1.000 / d.1250	1.000x1.000 / 1.250x1.250 // d.1.250	1.250x1.600
1.800	1.800	2.500
2.200	3.000	3.000
2.200x2.000 (TBD according to automation solution)	3.000x2.000 (TBD according to automation solution)	3.000x2.400 (TBD according to automation solution)
20 Torque Motor	20 Torque Motor	8 (worm-screw transmission) 15 (Torque Motor transmission - Option)
5.000	5.000	8.000
0,0001	0,0001	0,0001
20	20	20
175 (+80 / -95)	175 (+80 / -95)	175 (+80 / -95)
8.700	8.700	8.700
0,0001	0,0001	0,0001
40	40	40
175 (+80 / -95)	175 (+80 / -95)	175 (+80 / -95)
3.600	3.600	3.600
0,0001	0,0001	0,0001
35	35	35
175 (+80 / -95)	175 (+80 / -95)	175 (+80 / -95)
10.000	10.000	10.000
0,0001	0,0001	0,0001

Tank.G 5AX_TH

COMMON DATA FOR ALL AXIS CONFIGURATIONS

ACCURACY (as per ISO 230-2 standards)

Accuracy of positioning - linear axis (A)	µm	5
Sistematic positional deviation - linear axis (M)	µm	3
Repeatability - linear axis (R)	µm	4
Accuracy of positioning - circular axis (A)	arc sec	4
Sistematic positional deviation - circular axis (M)	arc sec	2
Repeatability - circular axis (R)	arc sec	3

SPINDLE

Tool-taper		HSK 100 / ISO 50 / HSK 63
Maximum speed	RPM	from 6.000 to 30.000
Maximum power	kW	up to 115
Maximum torque	Nm	up to 1.300
Accessories included		Variable preloading bearings

TOOL-MAGAZINE

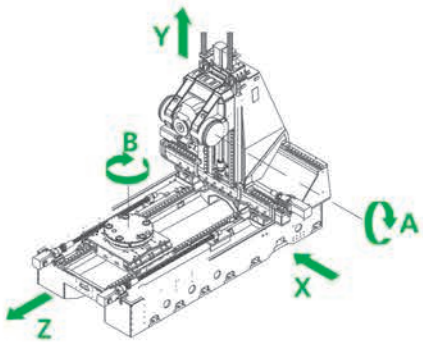
Type		Modular rack with tool movement system and exchange arm
Tool-taper		HSK 100 / ISO 50 / HSK 63
Number of tools (standard version)		80 / 199
Number of tools (option - up to)		399 - 599 - 999
Tool mass	kg	35 (HSK 63 15)
Maximum length	mm	600 / 700 (HSK 63 350)
Maximum diameter	mm	325 (HSK 63 200)
Tool changing time	sec	2.5 (HSK 100) / 3.0 (ISO 50)

COOLANT TREATMENT UNIT (BASIC VERSION)

Chip conveyor type			Scraping type
Total tank capacity		litres	1.500
Filter type			Self-cleaning (40 microns)
Standard low pressure system	Flow rate	litres/min	300 / 400 (to be divided into the various machine functions)
	Pressure	bar	2
	Piece washing with nozzles		300/400 litres/min (250 microns)
Standard high pressure system	Flow rate	litres/min	28 / 40
	Pressure	bar	20 / 80

Tank.G 5AX_TH_MT

5 Axis Tilting Head
Milling/Turning



WORK AREA

		Tank.G 5AX_TH_MT_1600
X-axis stroke	mm	1.600
Y-axis stroke	mm	1.500
Z-axis stroke	mm	1.960
X/Y/Z axes thrust	daN	3.000
X/Y/Z rapid feed speed	m/min	50
X/Y/Z axis acceleration	m/s^2	3

PALLET

Pallet dimensions	mm	d.1.000 / d.1.250 / d.1.400
Maximum fixture height	mm	1.500
Maximum fixture rotation diameter	mm	2.000
Maximum fixture dimensions	mm	2.000x1.600 (TBD according to automation solution)

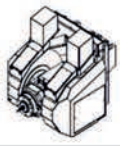
ROTARY TABLE

Maximum rotation speed	RPM	Max 500 Depending on the loaded mass
Maximum load allowed on pallet	kg	2.000
Minimum resolution	degrees	0,0001

TILTING HEAD UNIT

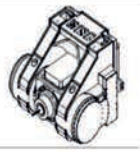
OPTION 1 - WORM-SCREW TRANSMISSION

Rapid rotation speed	RPM	20
A-axis tilting angle (standard version)	degrees	175 (+80 / -95)
Maximum torque (standard version)	Nm	8.700
Minimum resolution	degrees	0,0001



OPTION 2 - TORQUE MOTOR TRANSMISSION

Rapid rotation speed	RPM	35
A-axis tilting angle (standard version)	degrees	175 (+80 / -95)
Maximum torque (standard version)	Nm	10.000
Minimum resolution	degrees	0,0001

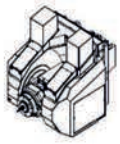
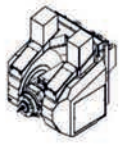
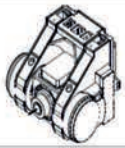
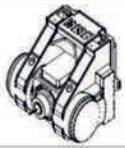


Tank.G 5AX_TH_MT

Tank.G 5AX_TH_MT_2000	Tank.G 5AX_TH_MT_2600
2.000	2.600
1.700	1.700
2.000	2.000
3.000	3.000
45	45
3	3

d.1.000 / d.1.250 / d.1.400	d.1.000 / d.1.250 / d.1.400
1.800	1.800
2.200	3.000
2.200X2.000 (TBD according to automation solution)	3.000X2.000 (TBD according to automation solution)

Max 200 Depending on the loaded mass	Max 200 Depending on the loaded mass
5.000	5.000
0,0001	0,0001

20		20	
175 (+80 / -95)		175 (+80 / -95)	
8.700		8.700	
0,0001		0,0001	
35		35	
175 (+80 / -95)		175 (+80 / -95)	
10.000		10.000	
0,0001		0,0001	

Tank.G 5AX_TH_MT

COMMON DATA FOR ALL AXIS CONFIGURATIONS

ACCURACY (as per ISO 230-2 standards)

Accuracy of positioning - linear axis (A)	µm	5
Sistematic positional deviation - linear axis (M)	µm	3
Repeatability - linear axis (R)	µm	4
Accuracy of positioning - circular axis (A)	arc sec	4
Sistematic positional deviation - circular axis (M)	arc sec	2
Repeatability - circular axis (R)	arc sec	3

SPINDLE

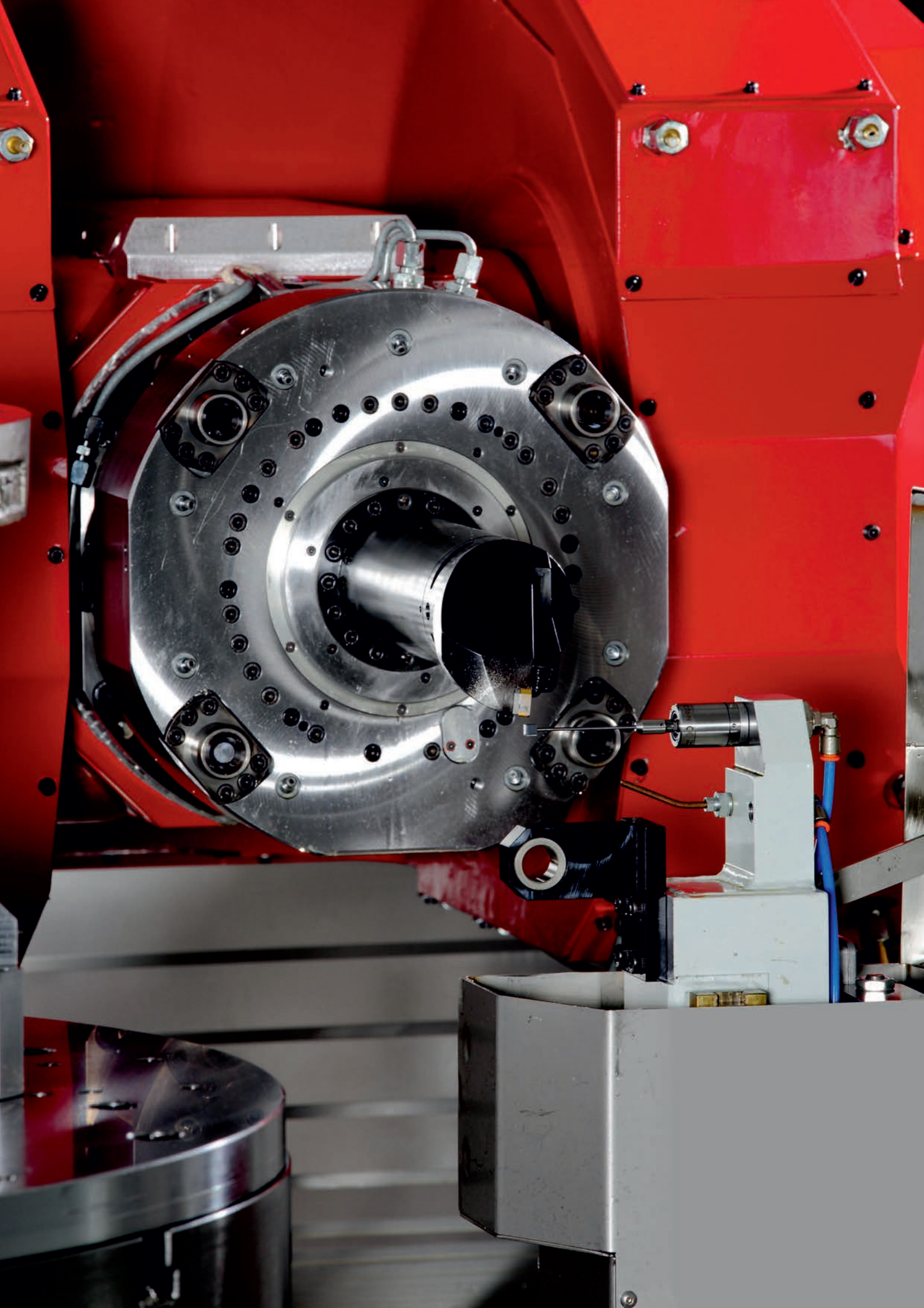
Tool-taper		HSK 100 T / CAPTO C8 / CAPTO C6
Maximum speed	RPM	from 8.000 to 18.000
Maximum power	kW	up to 91
Maximum torque	Nm	up to 633
Accessories included		Variable preloading bearings

TOOL-MAGAZINE

Type		Modular rack with tool movement system and exchange arm
Tool-taper		HSK 100 T / CAPTO C8 / CAPTO C6
Number of tools (standard version)		80 / 199
Number of tools (option - up to)		399 - 599 - 999
Tool mass	kg	35 (CAPTO C6 15)
Maximum length	mm	600 / 700 (CAPTO C6 350)
Maximum diameter	mm	325 (CAPTO C6 200)
Tool changing time	sec	2.5

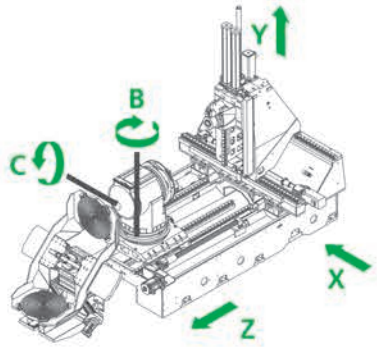
COOLANT TREATMENT UNIT (BASIC VERSION)

Chip conveyor type			Scraping type
Total tank capacity		litres	1.500
Filter type			Self-cleaning (40 microns)
Standard low pressure system	Flow rate	litres/min	300 / 400 (to be divided into the various machine functions)
	Pressure	bar	2
	Piece washing with nozzles		300 / 400 litres/min (250 microns)
Standard high pressure system	Flow rate	litres/min	28 / 40
	Pressure	bar	20 / 80



Tank.G 5AX_DIV

5 Axis - Horizontal / vertical rotary unit
(4th + 5th continuous axis)
Milling



WORK AREA

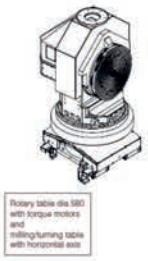
		Tank.G 5AX_DIV_1600
X-axis stroke	mm	1.600
Y-axis stroke	mm	1.000
Z-axis stroke	mm	1.400
X/Y/Z axes thrust	daN	3.000
X/Y/Z rapid feed speed	m/min	50
X/Y/Z axis acceleration	m/s^2	3

PALLET

Pallet dimensions	mm	d.800 / d.1.000
Maximum fixture height	mm	400
Maximum fixture rotation diameter	mm	1.100
Maximum fixture dimensions	mm	1.100

HORIZONTAL / VERTICAL ROTARY UNIT (4th + 5th CONTINUOUS AXIS)

Maximum load allowed on the pallet	kg	500
C-axis rotation speed	RPM	500 / 1.200
C-axis minimum resolution	degrees	0,0001
B-axis rotation speed	RPM	20
B-axis angle	degrees	270
B-axis minimum resolution	degrees	0,0001



Rotary table dia.580 with torque motors and milling/turning table with horizontal axis

ACCURACY (as for ISO 230-2 standards)

Accuracy of positioning - linear axis (A)	µm	5
Sistematic positional deviation - linear axis (M)	µm	3
Repeatability - linear axis (R)	µm	4
Accuracy of positioning - circular axis (A)	arc sec	4
Sistematic positional deviation - circular axis (M)	arc sec	2
Repeatability - circular axis (R)	arc sec	3

SPINDLE

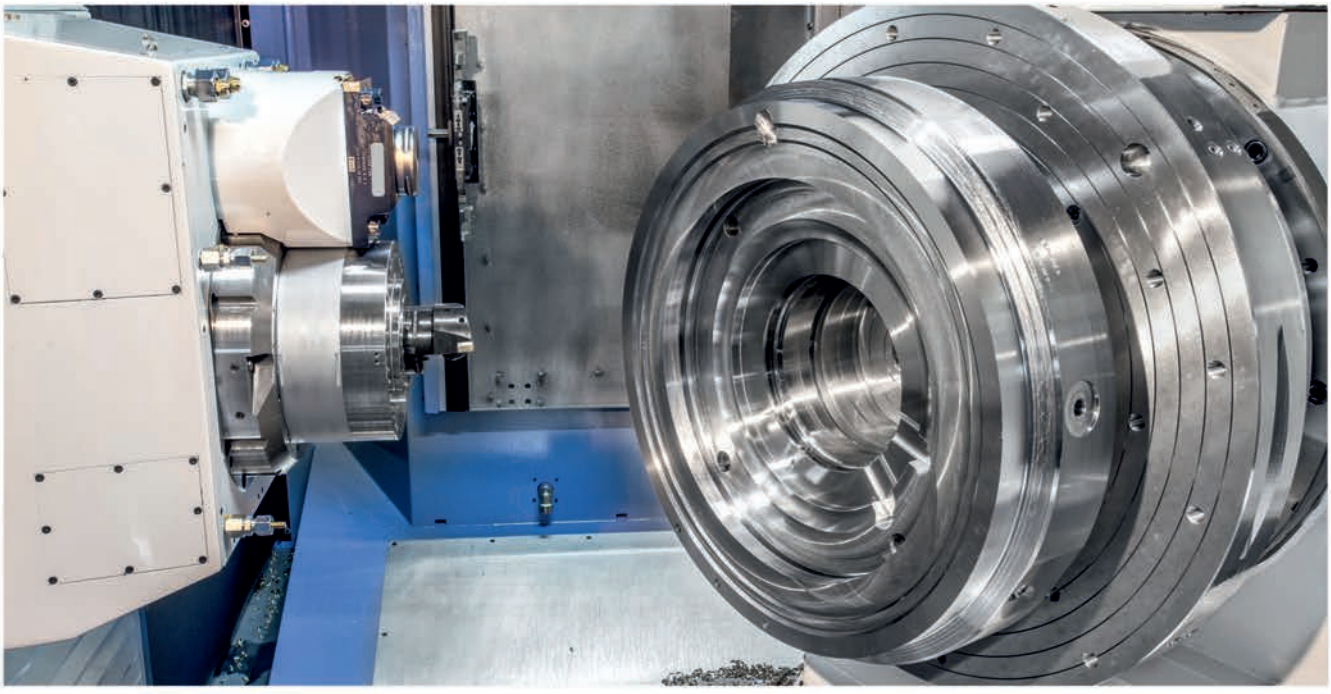
Tool-taper		HSK 100 T / CAPTO C8 / CAPTO C6
Maximum speed	RPM	from 8.000 to 18.000
Maximum power	kW	up to 91
Maximum torque	Nm	up to 633
Accessories included		Variable preloading bearings

TOOL-MAGAZINE

Type		Modular rack with tool movement system and exchange arm
Tool-taper		HSK 100 T / CAPTO C8 / CAPTO C6
Number of tools (standard version)		80 / 199
Number of tools (option - up to)		399 - 599 - 999
Tool mass	kg	35 (CAPTO C6 15)
Maximum length	mm	600 / 700 (CAPTO C6 350)
Maximum diameter	mm	325 (CAPTO C6 200)
Tool changing time	sec	2.5

COOLANT TREATMENT UNIT (BASIC VERSION)

Chip conveyor type			Scraping type
Total tank capacity		litres	1.500
Filter type			Self-cleaning (40 microns)
Standard low pressure system	Flow rate	litres/min	300 / 400 (to be divided into the various machine functions)
	Pressure	bar	2
	Piece washing with nozzles		300 / 400 litres/min (250 microns)
Standard high pressure system	Flow rate	litres/min	28 / 40
	Pressure	bar	20 / 80



CNC ENGINEERING

MCM consolidated experience in designing multitasking machining centres and the application of state-of-the-art scalable control technologies, allow flexible solutions to be developed, in order to meet any customer requirement. Thanks to the experience and the competence acquired over the years, MCM technical department engineers various types of systems, from single cell to complex production lines, with the integration of robotised cells and machines made by other manufacturers. All the software architectures are conceived for a total integration with the manufacturing planning and managing software, jFMX, designed and produced by the software developing dept MCE.

MAIN CNCs FEATURES WITH CONFIGURABLE OPTIONS >

CNC	SIEMENS	FANUC
Name	**Sinumerik 840D SL**	**30i / 31i B5 Series**
Display	12.5" to 19" with/without Touch Control	14" to 19" with/without Touch Control
User program memory	From 12 MB to 22 MB (optional)	2 MB (8 MB optional embedded / 2GB external memory)
Path / Channels	up to 10	up to 10
Controllable CNC axes	up to 93	up to 32

MCM SUPERVISING SOFTWARE jFMX

Java Flexible Manufacturing eXecutive

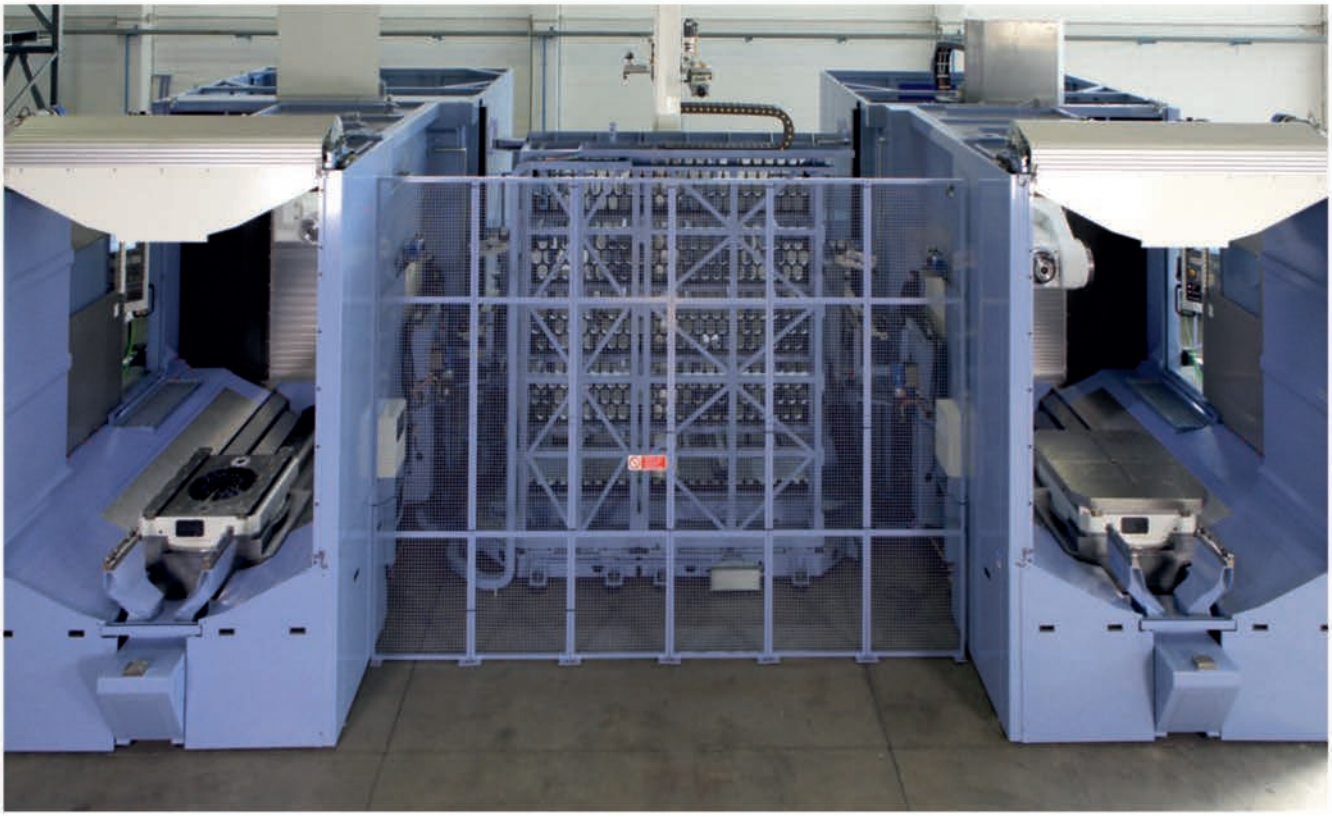
jFMX is the supervising software for planning and managing of flexible manufacturing systems, designed and produced by MCM software developing dept: MCE.
jFMX offers a strategic feature to a centralised coordination and an integrated management of the entire shop floor. Indeed, the machining centers equipped with jFMX, compared with those only managed by CNC, make it possible to:

- obtain a greater operational autonomy
- exploit production flexibility
- integrate the machine into a modern shop floor
- reduce the expertise required to the staff
- increase system productivity
- improve machining monitoring and control

thanks to:

- increase of unmanned work
- automatic management and planning of production
- integrated management of process and quality control information
- resource planning and improve timing of delivery schedule
- production monitoring and production cost of each component
- automatic restart of interrupted processes or machining resumption.

TANK.G AUTOMATION EXAMPLES



TANK.G AUTOMATION EXAMPLES

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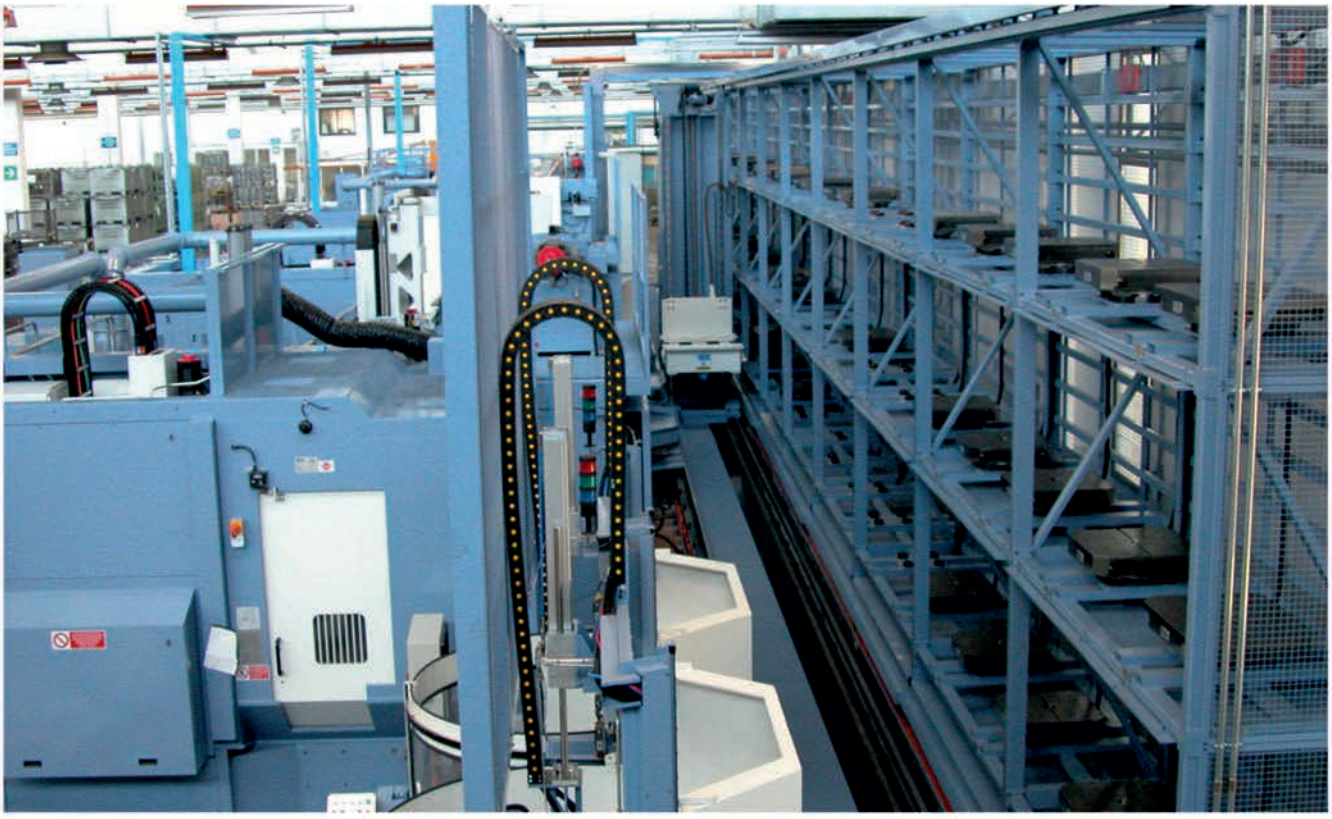
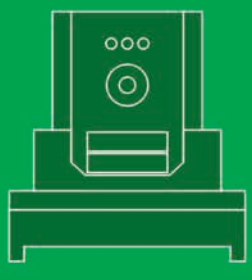


Tank.G

Tank.G 4AX_H
Tank.G 5AX_TH
Tank.G 5AX_TH_MT
Tank.G 5AX_DIV



_ MACHINING CENTERS
_ FLEXIBLE AUTOMATION
_ SYSTEM INTEGRATION
_ SUPERVISING SOFTWARE
_ MANUFACTURING TECHNOLOGY
_ SERVICE

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