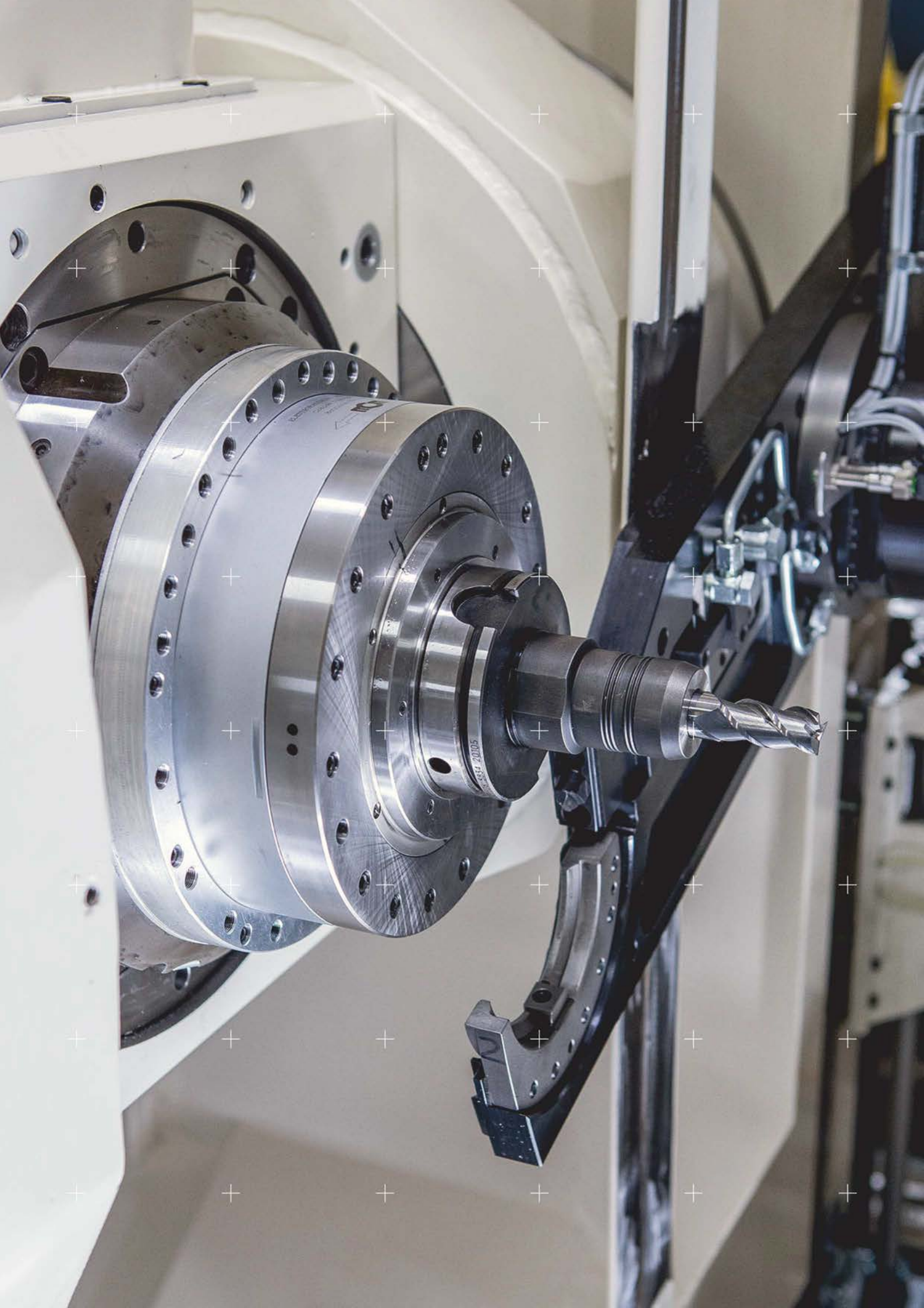
INTEGRATED MANUFACTURING SOLUTIONS

TANK

HORIZONTAL 4/5-AXIS MACHINING CENTER



TANK

HORIZONTAL 4/5-AXIS MACHINING CENTER

The TANK horizontal machining centers range is a solution capable of achieving great accuracy and dynamic performance, making it suitable for the most demanding machining processes.
The versatility of this model, configurable in 4-axis or 5-axis machining centers with tilting table, tilting head or vertical rotary table, has allowed to integrate several multitasking processes that combine milling, turning and grinding operations, finding its application in the machining of strategic and complex components for the Aerospace, Energy Oil & Gas and General Precision Mechanics sectors.

Dynamic performance:

- Incomparable performances on all types of materials
- High chip removal volume
- 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

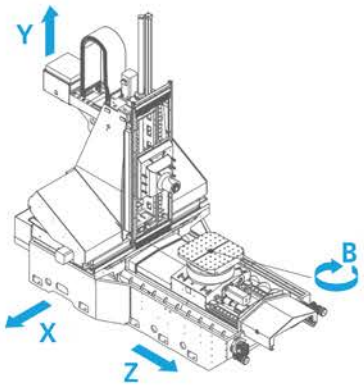
Extreme rigidity:

- 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

Tank 4AX_H

4 Axis Horizontal Milling



WORK AREA

		Tank 4AX_H_1300
X-axis stroke	mm	1.300
Y-axis stroke	mm	1.300
Z-axis stroke	mm	1.300
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	5

PALLET

Pallet dimensions	mm	630x800 / 800x800
Maximum fixture height	mm	1.300
Maximum fixture rotation diameter	mm	1.400
Maximum fixture dimensions	mm	1.400x1.120 (TBD according to automation solution)

ROTARY TABLE

Maximum rotation speed	RPM	20 (worm-screw transmission) 40 (Torque Motor transmission - Option)
Maximum load allowed on pallet	kg	1.500 / 2.000
Minimum resolution	degrees	0,0001

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 130
Maximum torque	Nm	up to 1.320
Accessories included		Variable preloading bearings

TOOL-MAGAZINE

Type	Modular rack with tool movement system and exchange arm

Tank 4AX_H

Tank 4AX_H_1600	Tank 4AX_H_1900
1.600	1.900
1.400	1.400
1.500	1.960
2.000	2.000
50	50
5	5

800x800 / 800x1.000 / 1.000x1.000	800x1.000 / 1.000x1.000 / 1.250x1.250
1.400	1.400
1.750	2.000
1.750x1.300 (TBD according to automation solution)	2.000x1.600 (TBD according to automation solution)

20 (worm-screw transmission) 40 (Torque Motor transmission - Option)	20 (worm-screw transmission) 40 (Torque Motor transmission - Option)
1.500 / 2.000 / 2.500	2.000 / 2.500
0,0001	0,0001

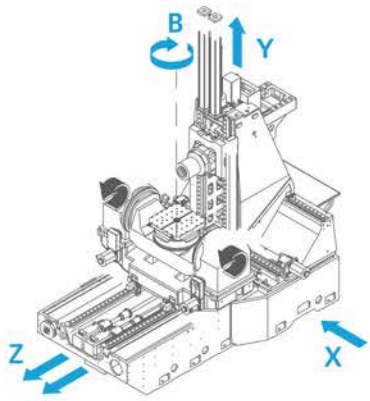
Tool-taper		HSK 100 / ISO 50 / CAPTO C6
Number of tools (standard version)		80 / 199
Number of tools (option - up to)		399 - 599 - 999
Tool mass	kg	35 / (HSK 63 15)
Maximum length	mm	600 / (HSK 63 350)
Maximum diameter	mm	325 / (HSK 63 200)
Tool changing time	sec	2.5 (HSK 100) / 3.0 (ISO 50)

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 (to be divided into the various machine functions)
	Pressure	bar	2
	Piece washing with nozzles		300 litres/min (250 microns)
Standard high pressure system	Flow rate	litres/min	28 / 40
	Pressure	bar	20 / 80

Tank 5AX_TT

5 Axis Tilting Table



WORK AREA

		Tank 5AX_TT_1300
X-axis stroke	mm	1.300
Y-axis stroke	mm	1.300
Z-axis stroke	mm	1.200
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	5

PALLET

Pallet dimensions	mm	630x630 / 630x800
Maximum fixture height	mm	700
Maximum fixture rotation diameter	mm	1.200
Maximum fixture dimensions	mm	1.200x1.050 (TBD according to automation solution)

TILTING TABLE UNIT (4th + 5th CONTINUOUS AXIS)

Maximum load allowed on the pallet	kg	800
A-axis tilting angle	degrees	135
Maximum A-axis (Tilting) speed	RPM	6
A-axis minimum resolution	degrees	0,0001
Maximum B-axis (Table) speed	RPM	12
B-axis minimum resolution	degrees	0,0001


Tilting rotary table for milling operations

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 8.000 to 30.000
Maximum power	kW	up to 115
Maximum torque	Nm	up to 1.300
Accessories included		Variable preloading bearings

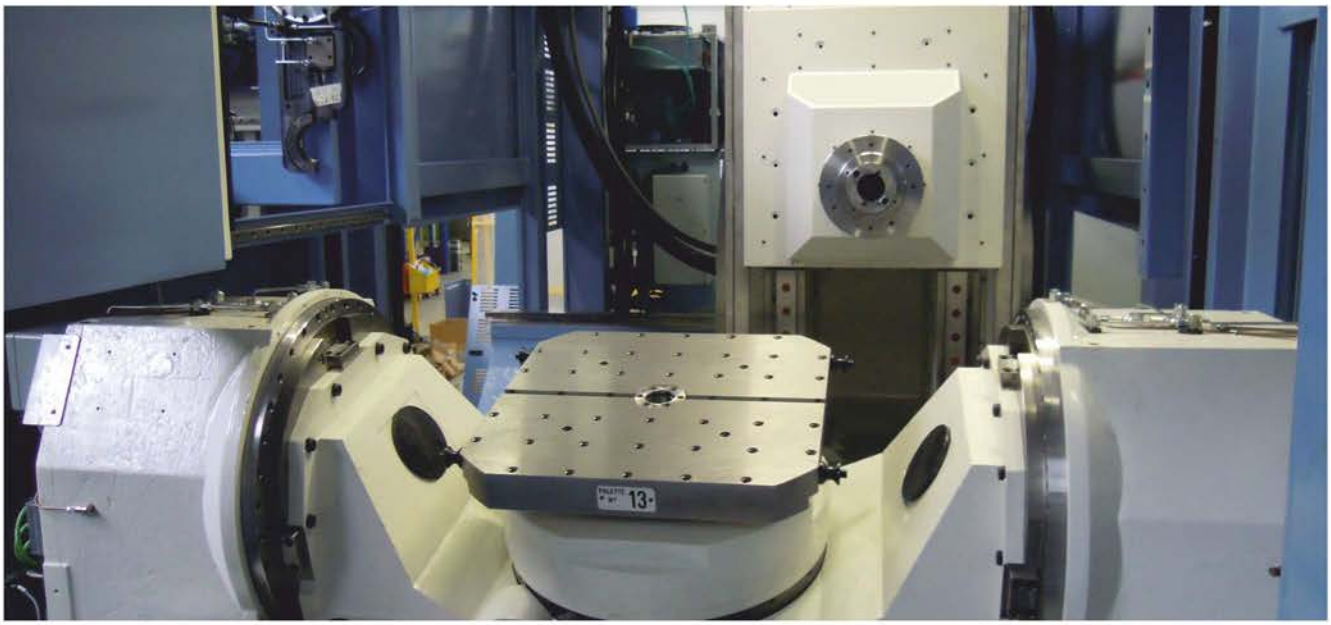
Tank 5AX_TT

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 / (HSK 63 350)
Maximum diameter	mm	325 / (HSK 63 200)
Tool changing time	sec	2.5 (HSK 100) / 3.0 (ISO 50)

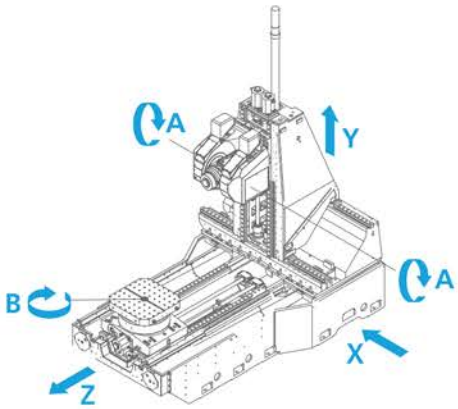
COOLANT TREATMENT UNIT (BASIC VERSION)

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 (to be divided into the various machine functions)
	Pressure	bar	2
	Piece washing with nozzles		300 litres/min (250 microns)
Standard high pressure system	Flow rate	litres/min	28 / 40
	Pressure	bar	20 / 80



Tank 5AX_TH

5 Axis Tilting Head
Milling



WORK AREA

		Tank 5AX_TH_1300
X-axis stroke	mm	1.300
Y-axis stroke	mm	1.400
Z-axis stroke	mm	1.400
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	5

PALLET

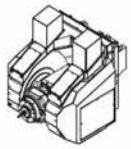
Pallet dimensions	mm	630x800 / 800x800
Maximum fixture height	mm	1.300
Maximum fixture rotation diameter	mm	1.400
Maximum fixture dimensions	mm	1.400x1.120 (TBD according to automation solution)

ROTARY TABLE

Maximum rotation speed	RPM	20 (worm-screw transmission) 40 (Torque Motor transmission - Option)
Maximum load allowed on pallet	kg	1.500 / 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	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
A-axis tilting angle (standard version)	degrees
Maximum torque (standard version)	Nm
Minimum resolution	degrees

Tank 5AX_TH

Tank 5AX_TH_1600	Tank 5AX_TH_1900	Tank 5AX_TH_1600 (YL)
1.600	1.900	1.600
1.400	1.400	1.500
1.420-1.600 (Depending on the type of pallet)	1.850-1.960 (Depending on the type of pallet)	1.850-1.960 (Depending on the type of pallet)
2.000	2.000	2.000
50	50	50
5	5	5
800x1.000 / 1.000x1.000 d.1.000	800x1.000 / 1.000x1.000 1.250x1.250 // d.1.000 / d.1250	800x1.000 / 1.000x1.000 1.250x1.250 // d.1.000 / d.1250
1.400	1.400	1.400
1.750	2.000	2.000
1.750x1.300 (TBD according to automation solution)	2.000x1.500 (TBD according to automation solution)	2.000x1.500 (TBD according to automation solution)
20 (worm-screw transmission) 40 (Torque Motor transmission - Option)	20 (worm-screw transmission) 40 (Torque Motor transmission - Option)	20 (worm-screw transmission) 40 (Torque Motor transmission - Option)
1.500 / 2.000 / 2.500	2.000 / 2.500	2.000 / 2.500
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
		175 (+80 / -95)
		10.000
		0,0001

Tank 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

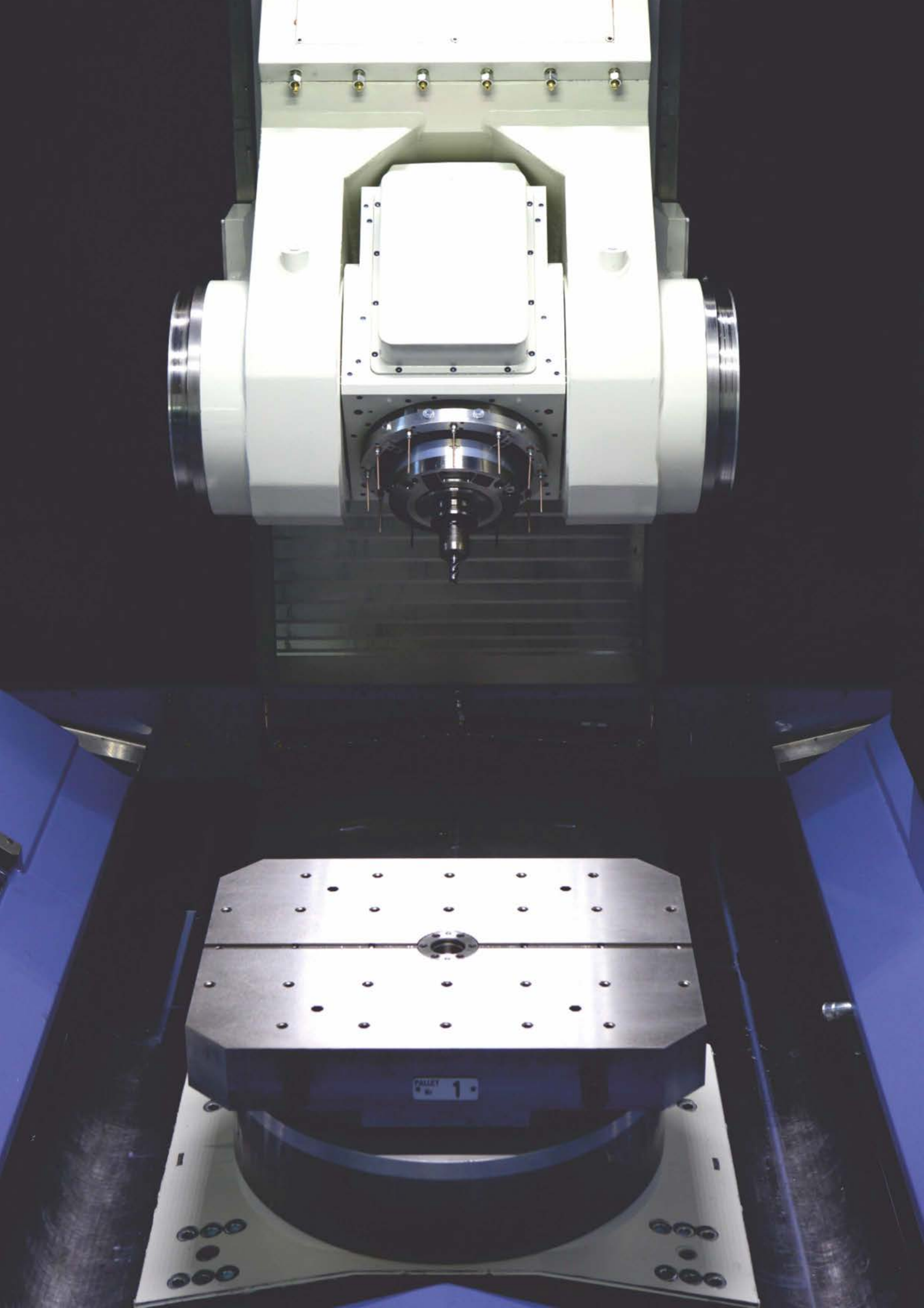
Tool-taper		HSK 100 / ISO 50 / HSK 63
Maximum speed	RPM	from 6.000 to 30.000
Maximum power	kW	up to 115
Maximum torque	Nm	up to 1.300
Accessories included		Variable preloading bearings

TOOL-MAGAZINE

Type		Modular rack with tool movement system and exchange arm
Tool-taper		HSK 100 / ISO 50 / CAPTO C6
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	460 / 550 / 600 (Depending on the configuration) (HSK 63 350)
Maximum diameter	mm	325 (HSK 63 200)
Tool changing time	sec	2.5 (HSK 100) / 3.0 (ISO 50)

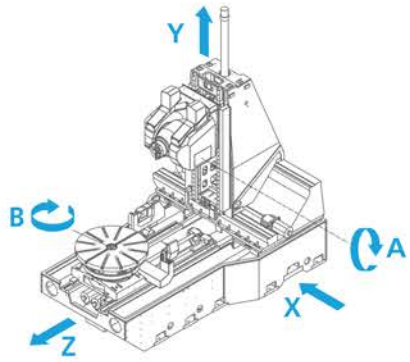
COOLANT TREATMENT UNIT (BASIC VERSION)

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 (to be divided into the various machine functions)
	Pressure	bar	2
	Piece washing with nozzles		300 litres/min (250 microns)
Standard high pressure system	Flow rate	litres/min	28 / 40
	Pressure	bar	20 / 80


PALLET
1

Tank 5AX_TH_MT

5 Axis Tilting Head
Milling / Turning



WORK AREA

		Tank 5AX_TH_MT_1300
X-axis stroke	mm	1.300
Y-axis stroke	mm	1.400
Z-axis stroke	mm	1.560
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	5

PALLET

Pallet dimensions	mm	d. 860 / d. 1000
Maximum fixture height	mm	1.300
Maximum fixture rotation diameter	mm	1.400
Maximum fixture dimensions	mm	1.400x1.120 (TBD according to automation solution)

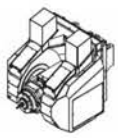
ROTARY TABLE

Maximum rotation speed	RPM	Max 500 Depending on the loaded mass
Maximum load allowed on pallet	kg	1.500 / 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
A-axis tilting angle (standard version)	degrees
Maximum torque (standard version)	Nm
Minimum resolution	degrees

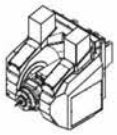
Tank 5AX_TH_MT

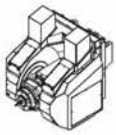
Tank 5AX_TH_MT_1600	Tank 5AX_TH_MT_1900	Tank 5AX_TH_MT_1600 (YL)
1.600	1.900	1.600
1.400	1.400	1.500
1.420 - 1.560	1.760 - 1.960	1.760 - 1.960
2.000	2.000	2.000
50	50	50
5	5	5

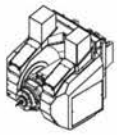
d.860 / d.1.000 / d.1.250	d.860 / d.1.000 / d. 1250 / d.1.400	d.860 / d.1.000 / d.1.250 / d.1.400
1.300	1.400	1.400
1.400	1.400	1.400
1.750x1.300 (TBD according to automation solution)	2.000x1.600 (TBD according to automation solution)	2.000x1.600 (TBD according to automation solution)

Max 500 Depending on the loaded mass	Max 500 Depending on the loaded mass	Max 500 Depending on the loaded mass
1.500 / 2.000	1.500 / 2.000	1.500 / 2.000
0,0001	0,0001	0,0001

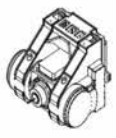
20	15	15
175 (+80 / -95)	180 (+90 / -90)	180 (+90 / -95)
8.700	8.700	8.700
0,0001	0,0001	0,0001







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



Tank 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

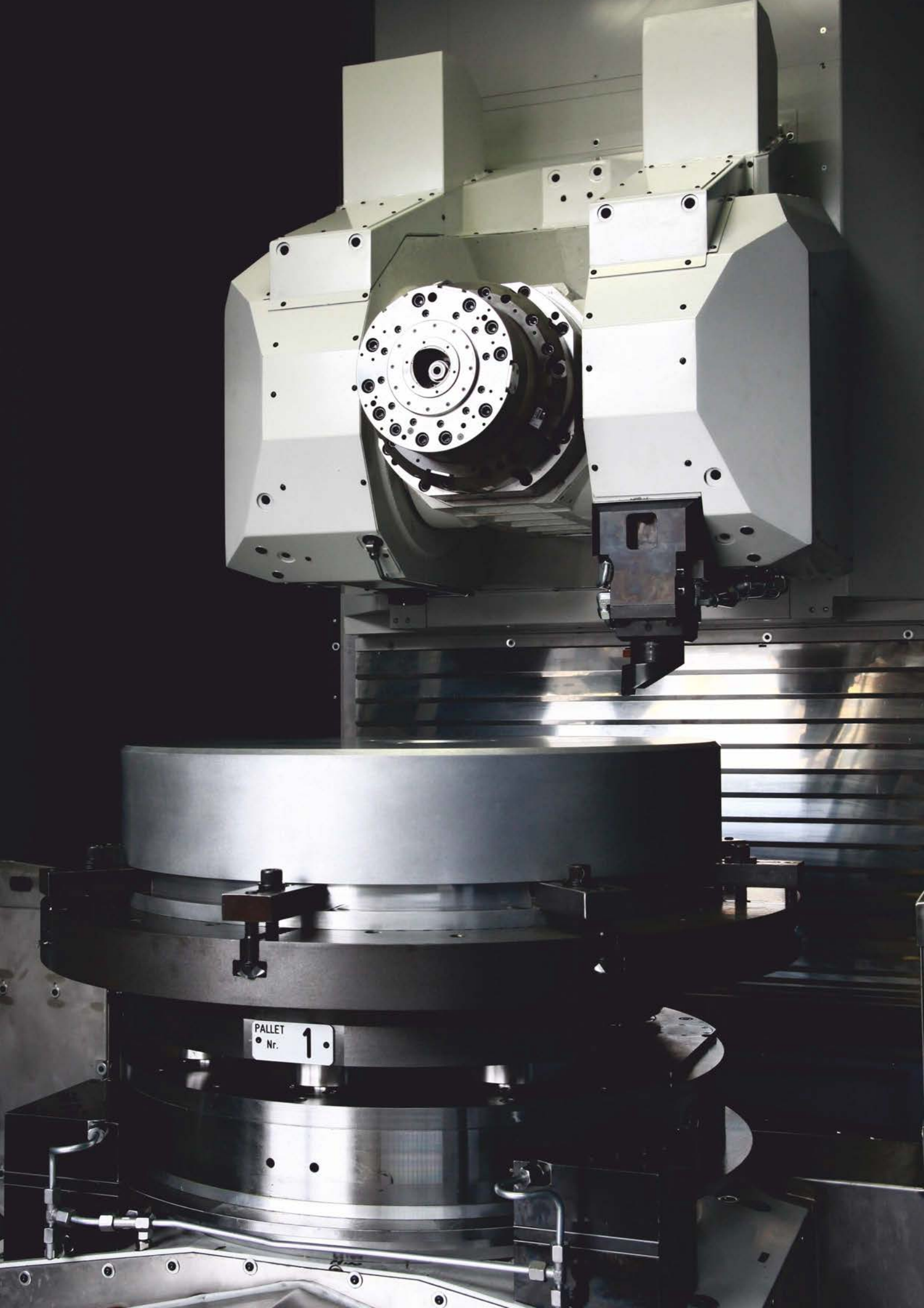
Tool-taper		HSK 100 T / CAPTO C8 / CAPTO C6
Maximum speed	RPM	from 8.000 to 18.000
Maximum power	kW	up to 91
Maximum torque	Nm	up to 633
Accessories included		Variable preloading bearings

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	460 / 550 / 600 (Depending on the configuration) (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 (to be divided into the various machine functions)
	Pressure	bar	2
	Piece washing with nozzles		300 litres/min (250 microns)
Standard high pressure system	Flow rate	litres/min	28 / 40
	Pressure	bar	20 / 80


PALLET
Nr. 1

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 AUTOMATION EXAMPLES

TANK AUTOMATION EXAMPLES

TANK AUTOMATION EXAMPLES

TOOL-MAGAZINE EXAMPLES

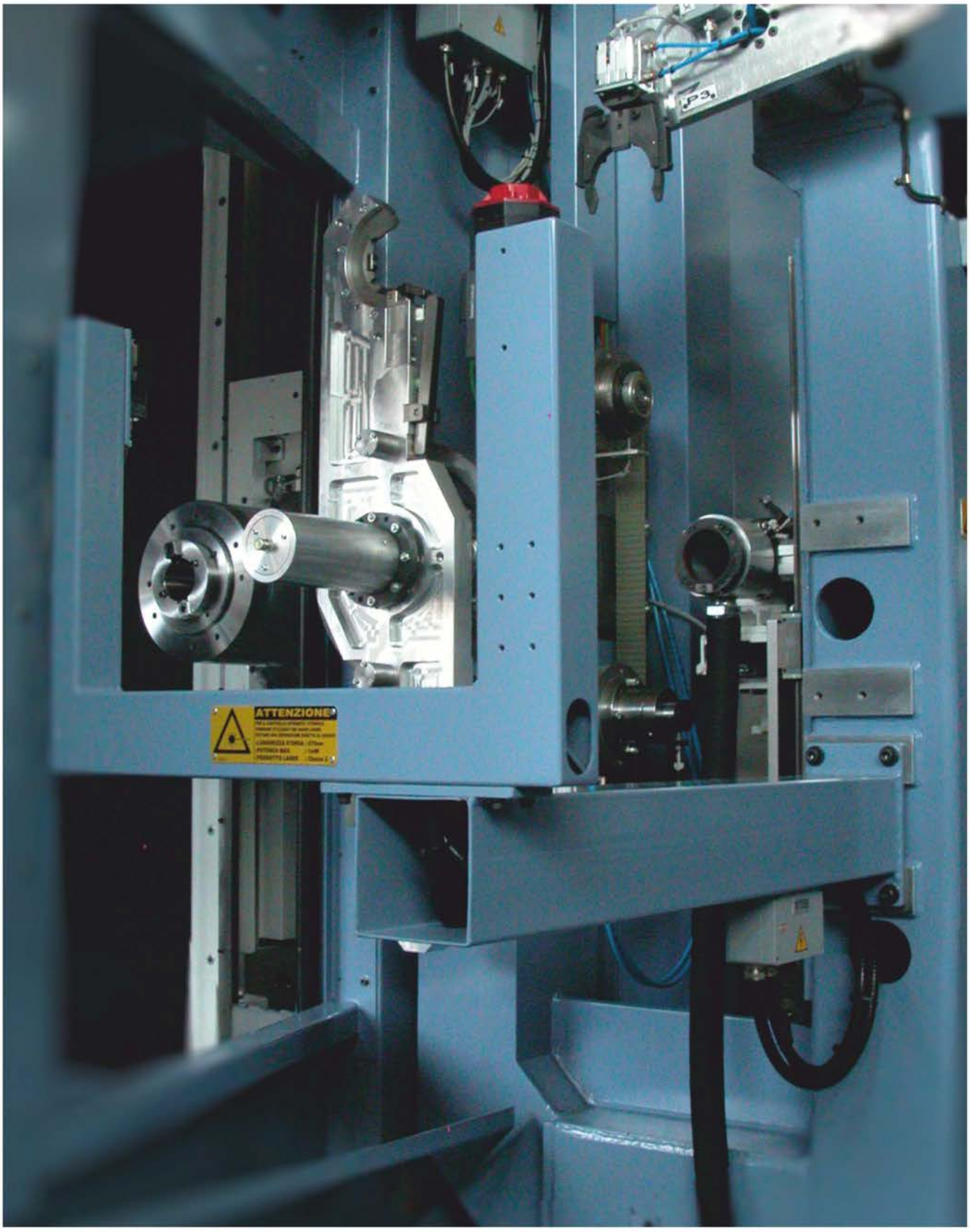
SOME DETAILS

SOME DETAILS

SOME DETAILS

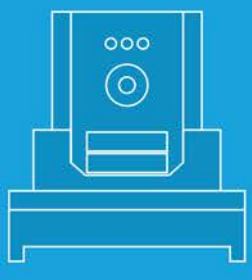
SOME DETAILS

SOME DETAILS



Tank

Tank 4AX_H
Tank 5AX_TT
Tank 5AX_TH
Tank 5AX_TH_MT



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

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