



THINK PARTS THINK TORNOS



MULTIALPHA

Multispindle automatic lathes with
parallel numerical control.

THE EFFICIENT AND ECONOMIC SOLUTION FOR MANUFACTURING PARTS OF MODERATE COMPLEXITY

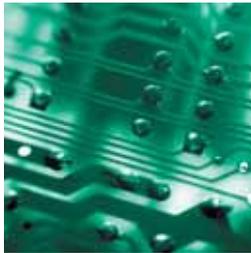
Automotive



Medical



Electronics



Miscellaneous



MULTIALPHA

New market requirements...

**Up to 8 spindles and up to 2 counter-spindles each mounted on a 3 axes slide.
MultiAlpha offers you a productivity and flexibility unequaled today.**



Simplicity et flexibility

- Easy programming thanks to TB-DECO Software
- Twin and independent back operations*
- 2 numeric manipulators*
- Integral palletization*
- Great chip evacuation thanks to a shorter slide*
- Chucker*



Performance

- 6 or 8 motorized spindles running at independent speeds
- High precision
- Complete manufacture of complex components
- PC control*



Rigidity

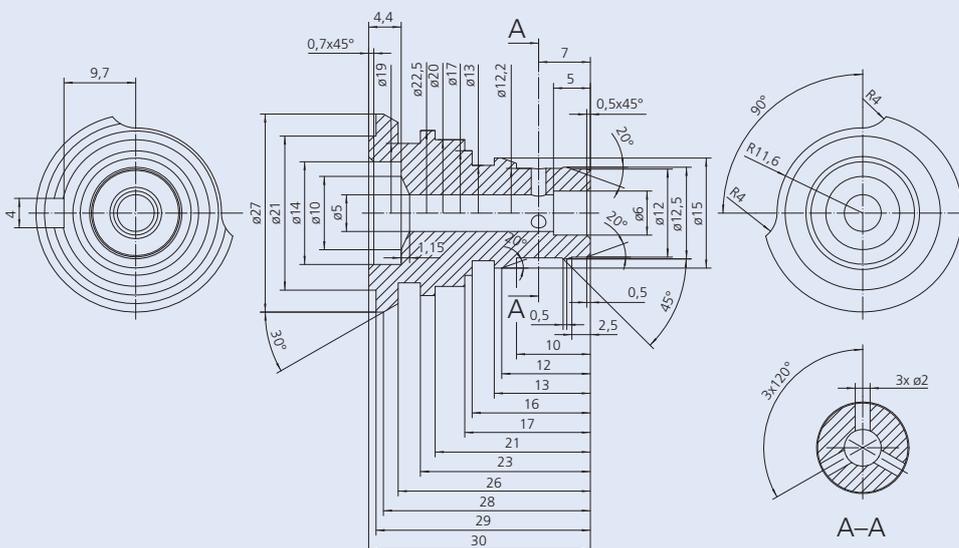
- Construction as verified by quality of finite elements
- High output

* Optional.

Machining example MultiAlpha 8x28

Material: 316L (1.4404) Stainless Steel, Ø 20

Production: 25 sec./piece



- External milling achieved by transmit function

PRESENTATION

... require new solutions:
Tornos is presenting the MultiAlpha range



To allow its clients to remain highly competitive when machining complex parts, Tornos is now offering the complete machining solution. The MultiAlpha allows operators to complete a maximum number of parts on the machine, without entailing secondary operations on

additional equipment. This is achieved with a very competitive cycle time, thanks to the double counter-spindle, which reduces back operating time by half and to the parts handling devices, which provides careful part evacuation!



6 OR 8 MOTORIZED SPINDLES RUNNING AT INDEPENDENT SPEEDS

Benefit: Ideal cutting speed at all times!

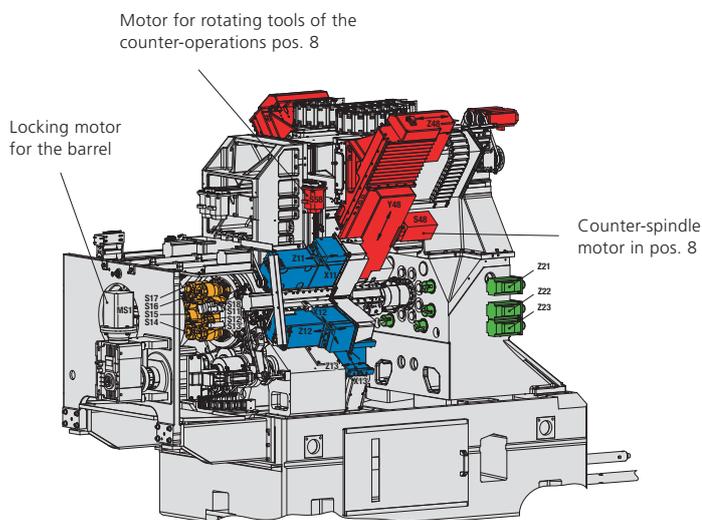
The new MultiAlpha range is supplied with the latest generation motorized spindles and is the most powerful machine in its category. Considering the experience gained in the technology of “motorized spindles”, our engineers pushed the power that could be obtained with this method to its very limits. This means that all types of machining operations are now within reach.

Advantages

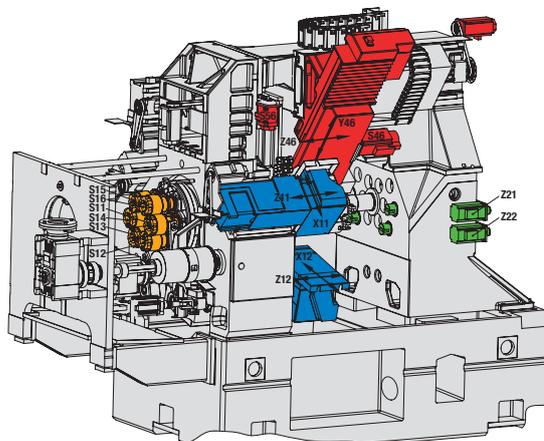
- Optimum speed for each position, depending on the type of machining operation.
- Stopping and positioning on each spindle.
- Maximum exploitation of new cutting tool technologies.
- Exceptional flexibility.
- Uncompromised productivity.

Each position can be used as a C axis, meaning that all types of operation, such as milling or positioned cross drilling can be carried out at all times, with all spindles. The spindles can all be synchronised at an angle, meaning that positioned operations can be executed on several stations (for example, transversal drilling on one station and tapping on another).

This means that customers have a choice of using a machine that actually best meets their requirements. Where a company has a machine fleet, this would mean that it could deploy additional multispindle machines operating according to the same concept. The overriding aim is to use the most efficient machine in terms of cost and productivity, based on the parts being manufactured.

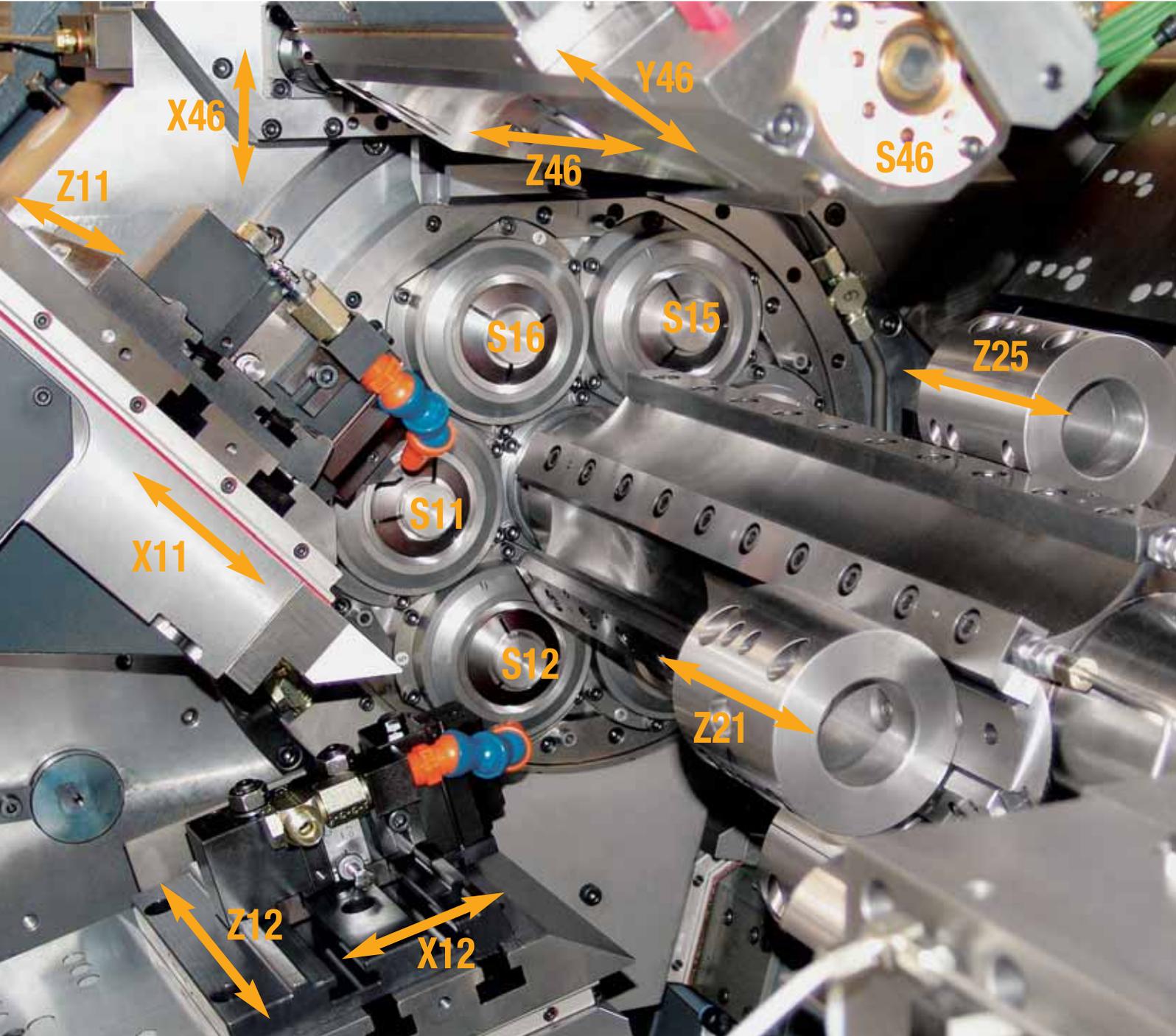


MultiAlpha 8x28



MultiAlpha 6x32

MultiAlpha 6x32



TWIN BACK OPERATIONS

Benefit: Completing more complex parts through multiple back-operations machining runs!

Parts have become more complex and sophisticated. Therefore additional back when machined in back-operation mode.

Operating principle

In order to face up to the more stringent machining requirements at this level, Tornos has fitted two counter-spindles. These grip the parts during cut-off and then execute operations such as turning, drilling, milling, etc. This is carried out in parallel with the main spindle operations! This concept allows the time spent on counter-operations to be halved.

Thanks to the independent motors of the counter-spindles and long travel in Y and Z, the MultiAlpha is capable of unequalled machining on the back side of the part.

Because the machine has twin counter-spindles, this consequently reduces back-operation cycle time.

Because of its flexible system, up to 5 tools can be fitted vertically or horizontally, with several combinations for executing back-operations.

The counter-spindle motorization can drive 3 tools per position, but you also have the facility of fitting high-frequency drills or other solutions! Coolant can be supplied to all tools to insure machining conditions.

MultiAlpha 8x28





Advantages

- 2 x 5 tools to execute extensive back-operations, with cycle times cut by half.
- Carries out counter-operations with 3 CNC axes.
- Flexible system allowing the tools to be fitted horizontally or vertically, fixed or turning, with central lubrication.

This concept of many additional back-working operations opens up many new possibilities in finishing parts on a multispindle machine.

This system combines the versatility currently only offered by single spindle machines with the productivity of a multispindle.

The versatility of the MultiAlpha goes yet further with its 6 or 8 motorised spindles and 2 counter-spindles, each of which can work with 5 tools. The MultiAlpha allows its operators to envision new opportunities...

The back-operation system on the MultiAlpha is flexible, meaning that it is also possible to use a machine with only one single counter-spindle.



2 NUMERIC PART MANIPULATORS

Benefit: Controlled part extraction!



Precision and the visual appearance of the parts being manufactured in today's market are becoming more and more stringent. Dents, marks and flaws are no longer permitted. In order to meet these requirements, Tornos developed a dual parts handling system, which picks up the parts and conveys them directly to the machining area and then conveys them outside of the machining area.

Advantages

- All parts are handled with care.
- No more flaws caused by impact.
- Facility of transferring the parts to another machine.

The system can be adapted and used for various applications, such as:

- Removing the part away from the machining area to a pre-cleaning station.
- For chuck applications, the parts can be loaded and unloaded using this manipulator from a vibratory feeder or other system.

INTEGRATED PALLETIZATION

Benefit: Easy to incorporate in a complete industrial process!



Many leading companies automated their processes to a maximum because of labour costs and the demand for very high quality output. The MultiAlpha was developed by incorporating a palletization system. Very often, commercial palletization systems are limited at machine interface level and therefore have to be assembled to the side of the machine, which takes up a lot of space. To overcome this problem, Tornos located the integral palletization system between the machine and control cabinet thereby optimising integration and saving on space. Large pallets of 400 x 600 mm were incorporated as standard to enhance autonomous operation.

Advantages

- Integrated palletization in the machine.
- Reduced surface area.

The general idea of palletization

Once the parts are loaded onto pallets, they can pass directly to a washing system.

CHUCKER

	Motorized loading		Robotized loading	
	Grippers	Chucks	Grippers	Chucks
✓ standard * on request X not available				
MultiAlpha Chucker	✓	*	✓	*
Minimum cycle time	4 secs		4.5 secs	
Modularity / flexibility	+		++	
Changing the start-up	+		++	

The requirements in terms of chucks are continuously evolving. Both profiles and dimensions are changing. To be able to offer the maximum amount of flexibility, a robot fitted in place of the slide in position 1 now offers easier loading for different types of parts. This also allows angular positioning of the parts.

One of the other advantages when using a robot is that there is the option to unload parts in a controlled way, as far as the machining time will allow. The "robotic loading" chucker concept can be adapted for use with the entire MultiAlpha range.

Example of a solution:

A vibrating bowl, which guarantees a predefined autonomy, offers up the parts to the robot placed in position 1, which is within the machining zone. The robot grips the part and loads it inside the spindle.

Technical information:

- Minimum loading cycle time: 4.5 seconds.
- Clamping diameter, minimum: 4 mm to maximum: 55 mm
- Hydraulic or mechanical clamping with gripper or chuck.
- Angular orientation of the parts possible.
- Several options available: tracing, palletization, ejection of checked parts.
- Adaptable to the different machine configurations (2x4, ...)

CHUCKER

This chucker is an economic solution for large volumes of parts. So as to obtain maximum performance, a motorized system, which allows rapid loading of a specifically defined part, has been fitted in place of the slide in position 1. This system is designed for parts requiring cylindrical revolution, which do not need any angular orientation. The "powered loading" chucker concept can be adapted for use with the entire MultiAlpha range.

Clamping by chuck:

The use of a chuck is less demanding in terms of the quality of the billets, thanks to its 2 mm stroke. The hydraulic control allows linear adjustment of the clamping force.



Technical information:

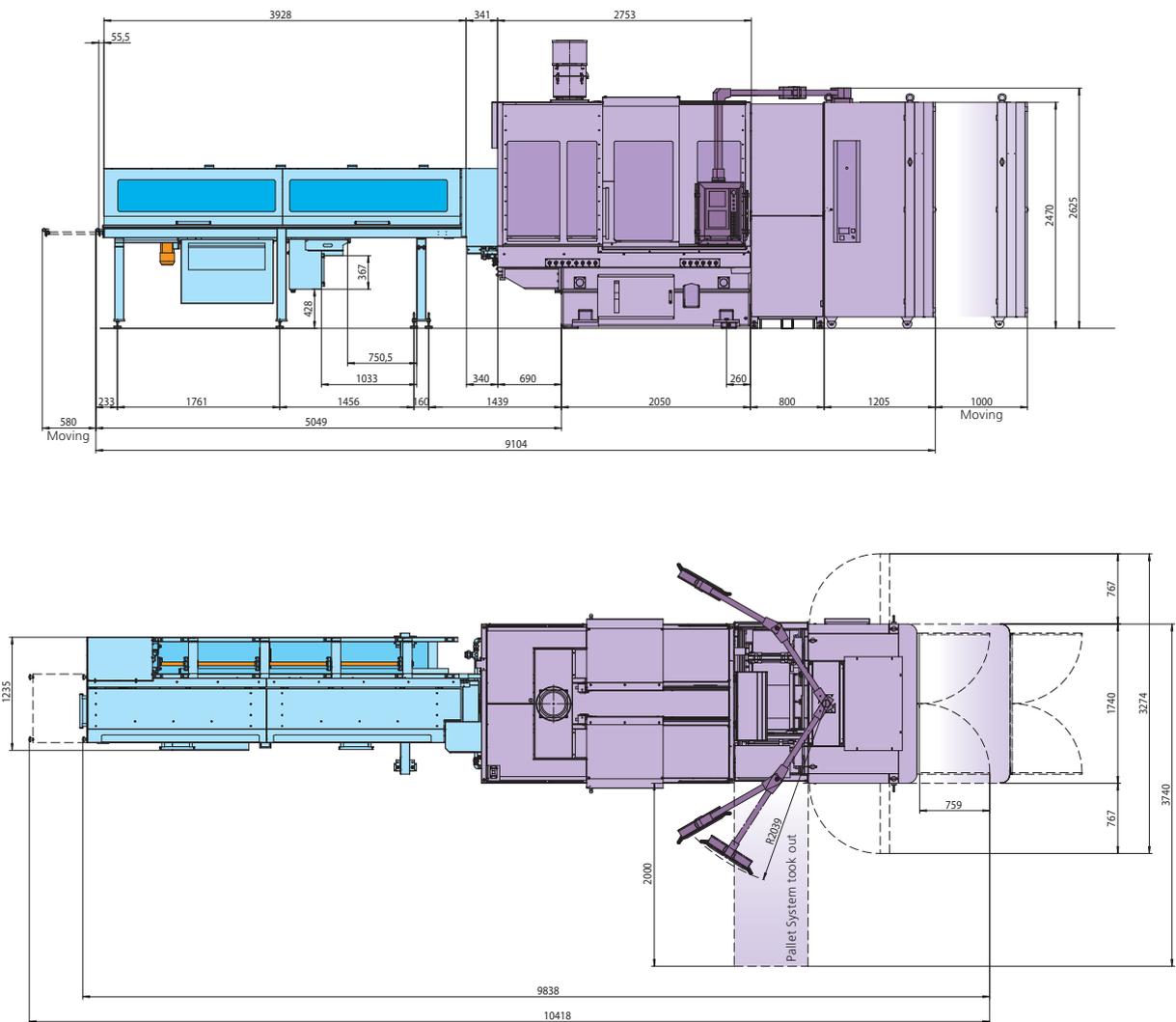
- Minimum loading cycle time: 4 seconds.
- Clamping diameter, minimum: 4 mm to maximum: 55 mm
- Hydraulic or mechanical clamping with gripper or chuck.
- Several options available: tracing, palletization, ejection of checked parts.
- Adaptable to the different machine configurations (2x4, ...)
- This concept is applied for parts where the blanks are parts which require cylindrical revolution, and do not need any angular orientation.



MULTIALPHA

Key benefits

- Motorized spindle (= ideal speed for each position).
- Twin counter-spindles (highly complex parts at high output).
- Controlled part unloading.
- Integrated palletizing.



TECHNICAL SPECIFICATIONS

	MultiAlpha	6x32	8x28
Weight (with oil)	kg	~ 12'000	~ 12'000
Cutting oil tank capacity	l	up to 2,000	up to 2,000
Installed power	kVA	90	65
Pneumatic group pressure	bars	6	6

TECHNICAL CHARACTERISTICS

TECHNICAL SPECIFICATIONS	MultiAlpha	6x32	8x28
Bar passage	mm	32 (34)	28 (28)
Max. component length	mm	120	90 (140)
Max. speed of motorspindles	rpm	6'000	7'000
Power of motorspindles	kW	11 (13.7)	11.6 (15.4)
Torque rating of motorspindles	Nm	25 (32.5)	16 (20.2)
Max. speed of counter-spindle	rpm	6'000	8'000
Power of motor/counter-spindle	kW	3.7 (9.5)	3.7 (9.5)
Motor torque of counter-spindle	Nm	8.3 (24)	8.3 (24)
Max. speed of motorquill	rpm	8'000	8'000
Power rating of motorquill	kW	5.3 (7.5)	5.3 (7.5)
Torque rating of motorquill	Nm	7 (9.2)	7 (9.2)
Max. speed of high-power motorquill	rpm	8'000	8'000
Power rating of high-power motorquill	kW	10.6 (15)	10.6 (15)
Torque rating of high-power motorquill	Nm	14 (18.4)	14 (18.4)
Max. speed of tool drive motor for counter-operation	rpm	6'000	6'000
Power of tool drive motor for counter-operation	kW	1.9 (4.7)	1.9 (4.7)
Torque of tool drive motor for counter-operation	Nm	5.3 (21.2)	5.3 (21.2)
Number of slide axes		19 (24)	25 (30)
Number of rotary axes		7 (11)	9 (13)
Transverse slide stroke X1	mm	(positions 1 to 5) 60	50
Transverse slideway stroke Z1	mm	(positions 1, 4 and 5) 100	80
Transverse slideway stroke Z1	mm	(positions 2 and 3) 80	80
Stroke of front unit Z2	mm	(positions 1 to 5) 200	200
Stroke of cutting slideway	mm	(X15, X16) 40	(X17, X18) 40
Stroke of slideway for counter-operation	mm	52	75
Stroke of slideway for counter-spindle	mm	280	280
Stroke of slideway on counter-spindle	mm	200 (450)	200 (450)
Number of fixed tools for counter-operation		5 (10)	5 (10)
Number of rotating tools for counter-operation		3 (6)	3 (6)
Cooling of the spindles		Oil	Oil
NC unit		Fanuc 30i	Fanuc 30i
Programming system		TB-DECO	TB-DECO

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