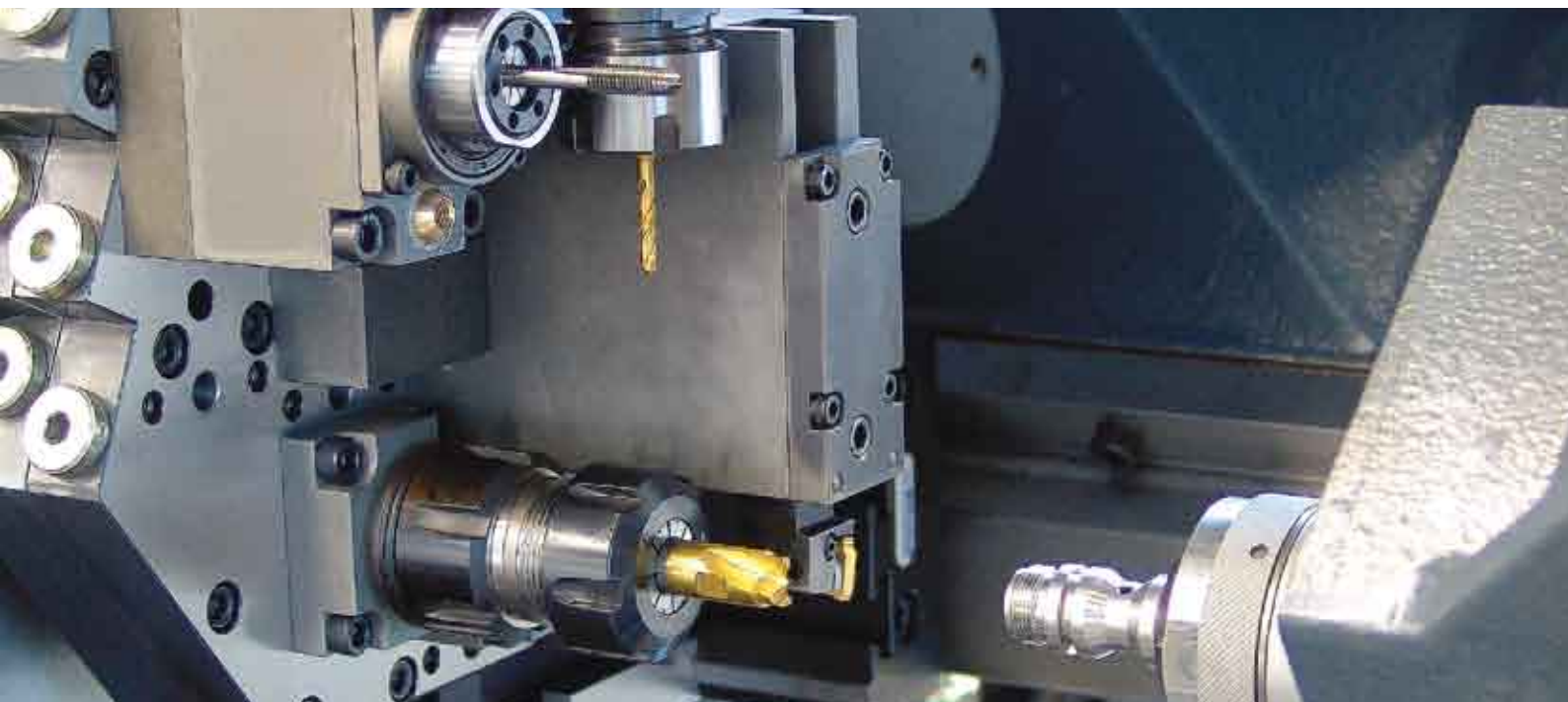




MultiAlpha 6x32

Multispindle NC-controlled automatic turning machine



THINK PARTS THINK TORNOS

MULTIALPHA 6x32

Market developments...

The new benefits enable you to:

- Manufacture complete complex components
- Operate at an ideal cutting speed for each position
- Unload workpieces in a controlled manner

Combine these with the benefits of the TORNOS multispindle lathes...

- Unrivalled accessibility
- High precision achieved through robustness
- Maximum flexibility
- Outstanding productivity



PRESENTATION

...calls for new solutions:
TORNOS presents the MultiAlpha 6x32



MULTIALPHA 6x32

Market developments...

The automotive manufacturing sector is developing at a rapid pace, a pace that requires component quality to be continually improved almost on a daily basis. This quality improvement is required by automotive manufacturers that simultaneously exert downward pressure on unit prices.

The production of components passes through several different and distinct phases, starting with pre-machining on a multispindle turning machine. Components then progress to a second machine. These processes necessitate multiple



handling, which in turn increases the risk of component damage while at the same time adversely affecting precision. Precision can be affected by the multiple fixture settings required to perform secondary operations. The Tornos philosophy favours an integrated solution occupying a smaller floor area and this in turn gives rise to a very different kind of production strategy.

- **Integrated solution**
- **Reduced floor area**

PRESENTATION

...calls for new solutions:
TORNOS presents the MultiAlpha 6x32

How do you go about producing components rapidly in a single fixture setting?

- 1 Integrated bar feeder from Tornos. Capacity: 2'000 kg
- 2 Complete system for swarf and oil
- 3 Counter-operation
- 4 Operation
- 5 Unloading of inspected components
- 6 Palletisation



To enable you to remain highly competitive when machining complex components, TORNOS is offering an integrated solution that occupies a smaller floor area than previous systems.

MultiAlpha 6x32 enables users to complete a maximum number of components on a single machine without having to relocate them to other machines during the same series of operations. It achieves this at a very competitive cycle time by virtue of its manipulator, which ensures that completed components are released very carefully in excellent condition!

This machine has been conceived as a modular system. The multiplicity of options available enables us to adapt this machine to your specific machining requirements, including swarf processing and handling. Moreover, engineers from the applications team can develop solutions customised to meet your precise needs. This organisation enables you to align your production concept with our product line via the MultiAlpha 6x32.

BENEFIT : COMPLETING COMPLEX COMPONENTS !

Multiple machining operations in counter-operation mode !

Components have generally become more complex in counter-operation mode.

Operational principle

To respond to the more demanding machining requirements Tornos has fitted a counter-spindle to a column on the MultiAlpha 6x32. The counter-spindle holds the component during the cutting operation then presents the workpiece for a number of operations on the back of the component, e.g. turning, drilling, milling.

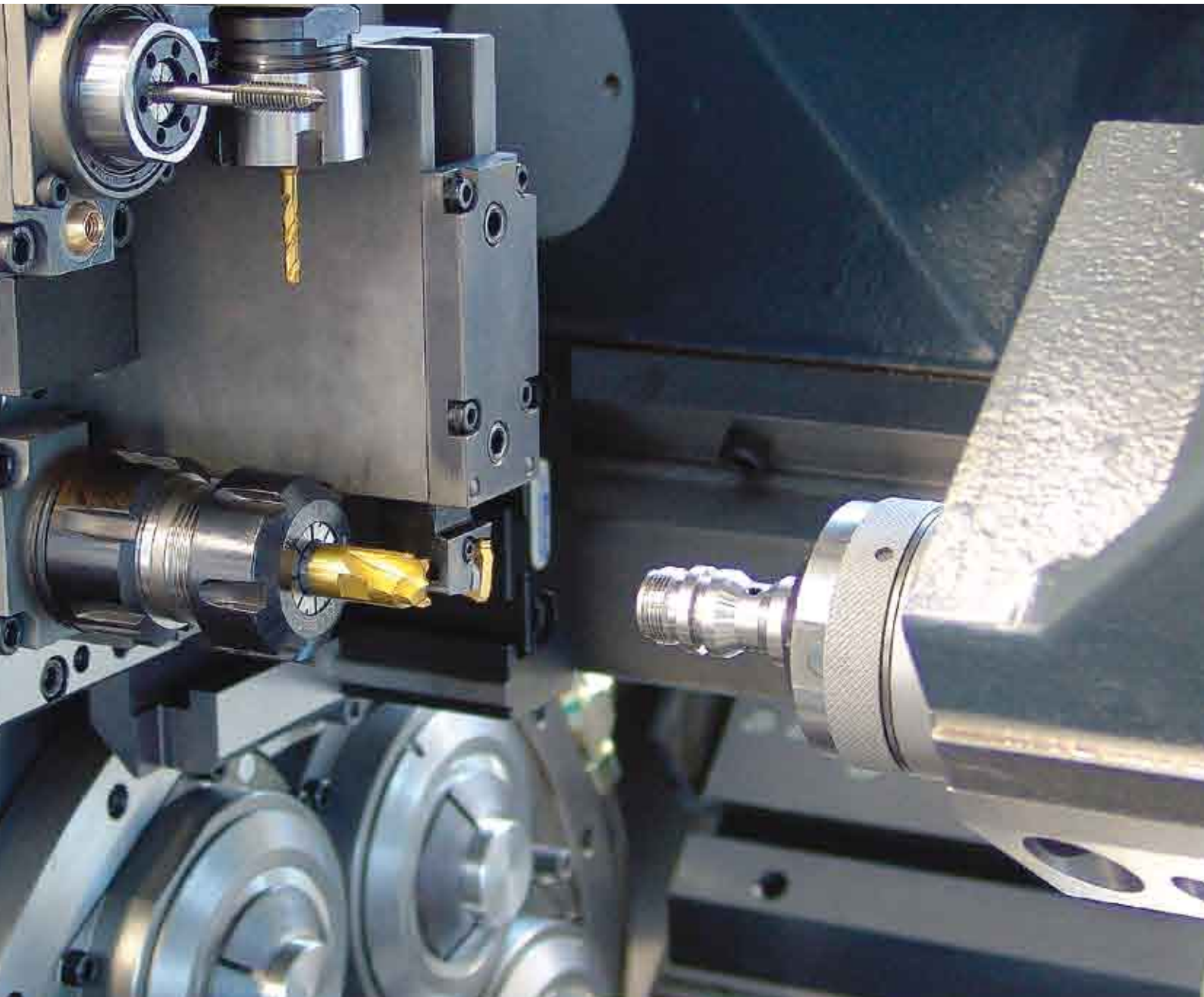
Thanks to the independent motor on the counter spindle and to the extensive stroke in Y and Z, the MultiAlpha 6x32 is capable of performing unrivalled machining operations on the back of the component.

The slide can be equipped with 5 tools in vertical and/or horizontal position, with an increased number of combinations. Three tools can be driven by an independent motor that enables the use of high-speed drills or alternate solutions! To assure optimum machining conditions, all the tools have integrated lubrication. Even fixed drills can be lubricated via a central bore.



Advantages

- Up to 5 tools can work in counter-operation mode
- Axes X, Y, Z and C combined with the "Transmit" function give greater flexibility in counter-operation
- Flexible system for installing fixed or rotary horizontal or vertical tools
- Lubrication through the centre of fixed tools



This concept gives rise to an entirely new approach to multi-spindle machining of components, which offers great scope for working in counter-operation mode.

BENEFIT : OPERATE AT AN IDEAL CUTTING SPEED FOR EACH POSITION !

Motorspindles with independent speeds

The new MultiAlpha 6x32 is equipped with the latest generation of motorspindle with synchronous motors. These maintain maximum torque right up to high rotational speeds.

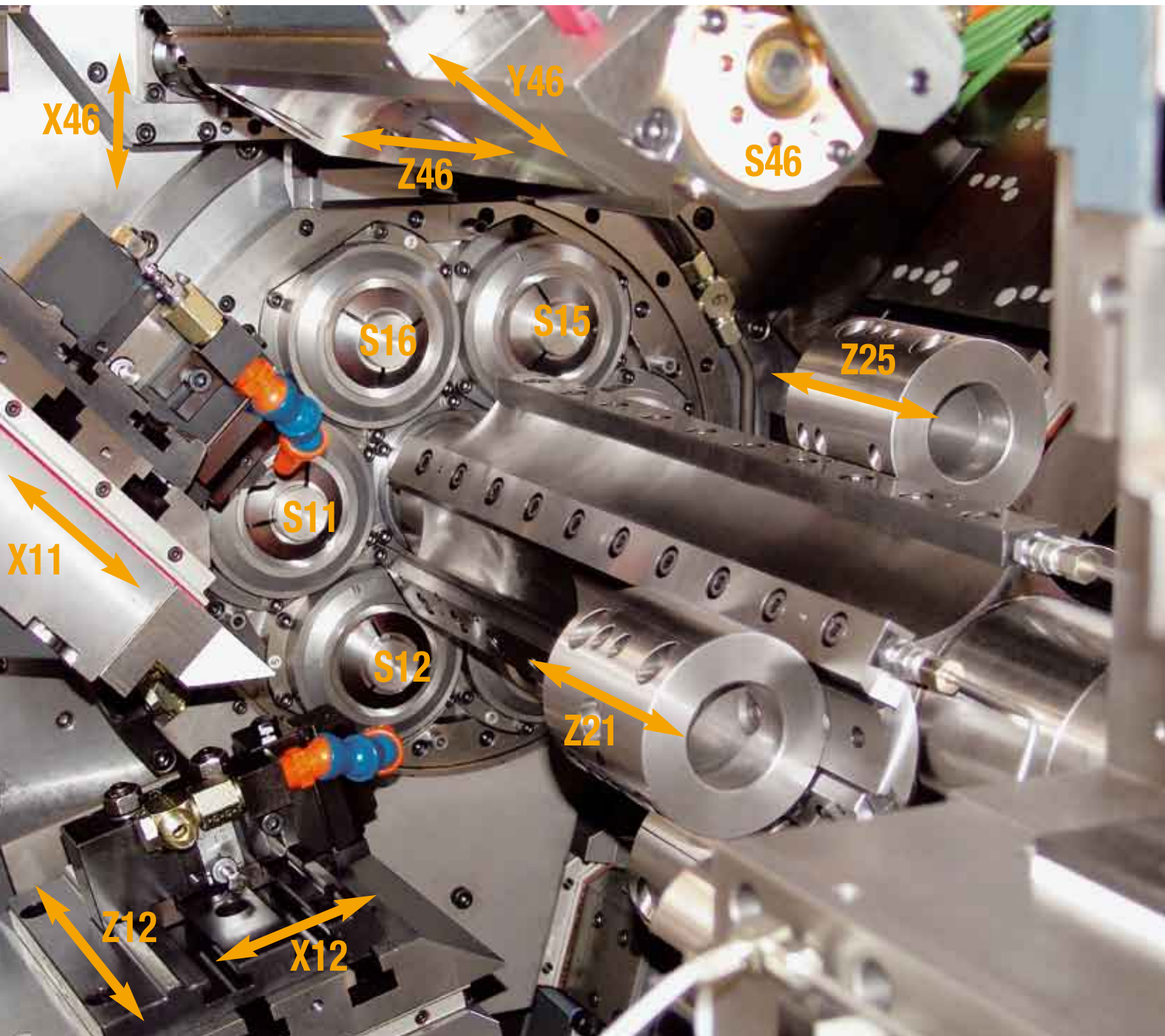
The motorspindles with independent speed settings enable the full range of cutting tools to be employed. This extends tool service life and improves the quality of components produced. The high rate of stock removal means that simultaneous machining operations can be performed together, including operations on the front unit. This reduces production times.

Every position can be used as a C axis, this allows any positioned transverse milling or drilling operation to be performed at any time and on all spindles. These spindles can be synchronised in angular fashion which means that positioned operations can be performed at several different stations (e.g. eccentric drilling/internal threading).



Advantages

- Optimum speed on each position in accordance with the type of machining required
- Unrivalled capacity for stock removal
- Great flexibility – C axes, "Transmit" function, stoppages
- Exceptional spindle acceleration

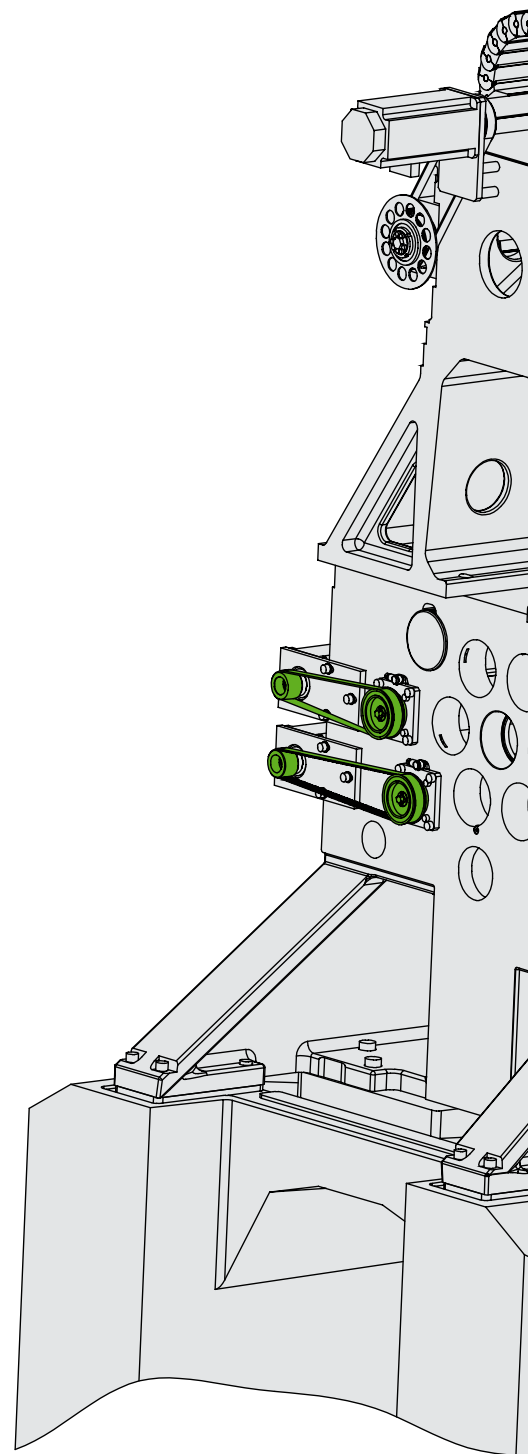
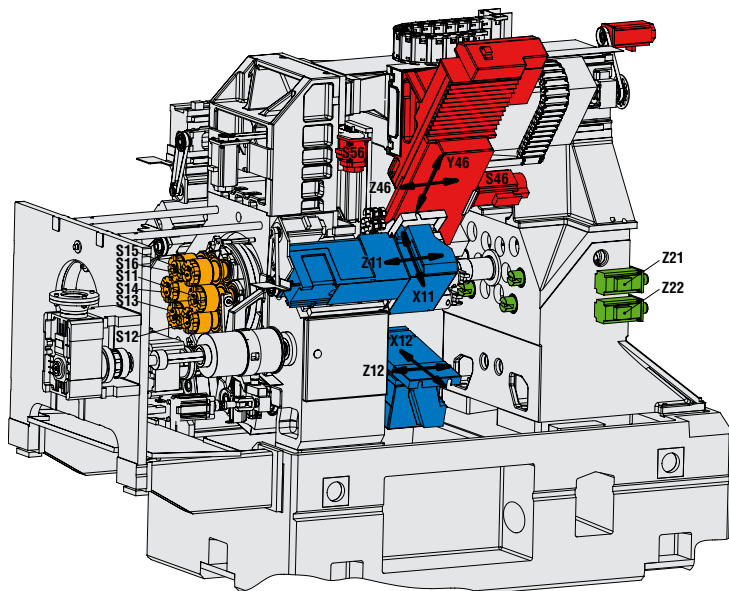


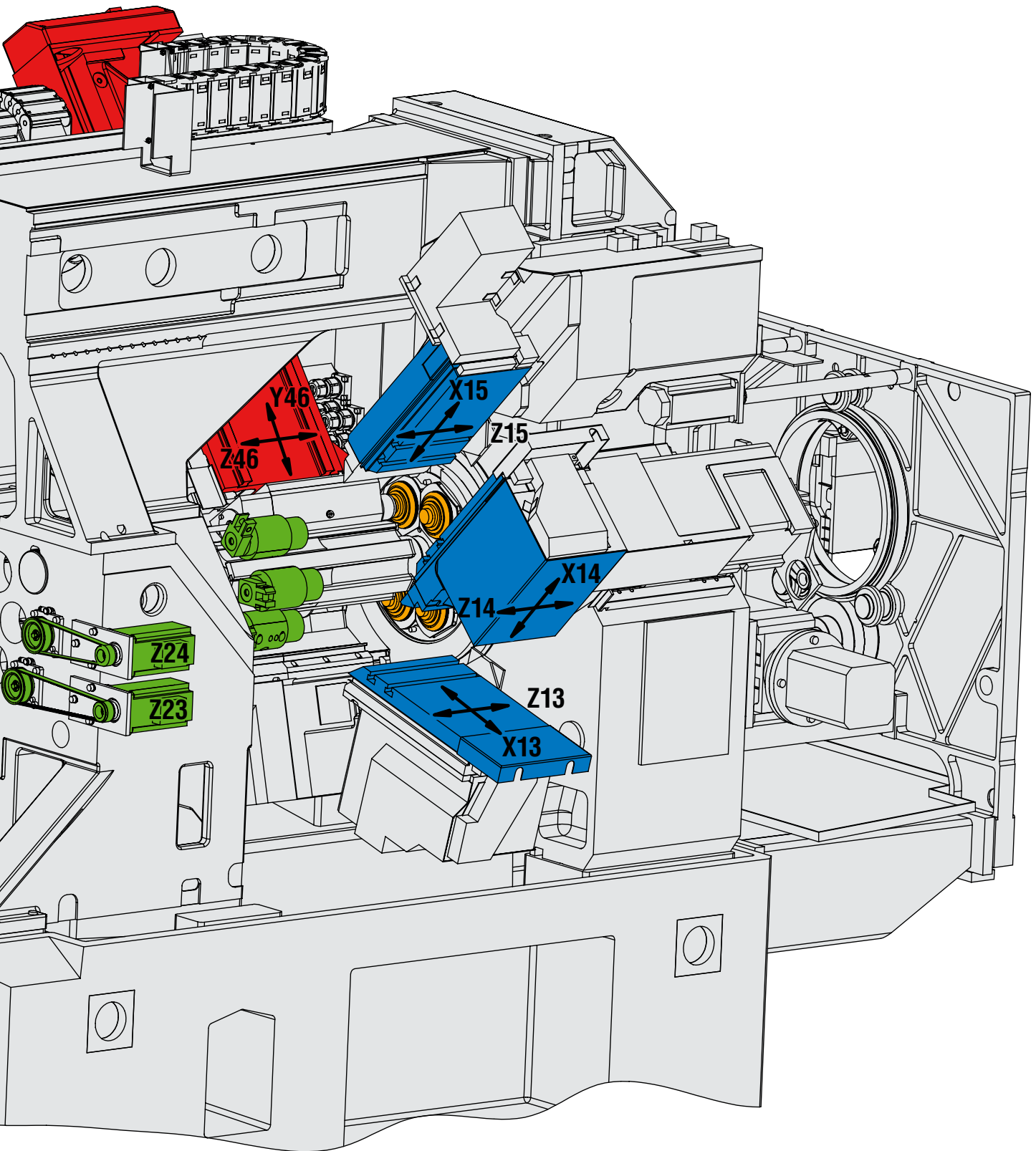
BENEFIT : OPERATE AT AN IDEAL CUTTING SPEED FOR EACH POSITION !

Motorspindles with independent speeds

The motorspindles are equally flexible on the front unit

To help you achieve maximum flexibility, the front units can be fitted with motorquills. Tornos engineers have used the latest generation of motors for the motorquill units and the motorspindles. To meet your needs, two versions of motorquills are available. The high-performance motorquill delivers high torque right from its lowest speeds while the high-speed option retains the same torque rating right up to exceptionally high rotational speeds.





BENEFIT: UNLOADING COMPONENTS IN A CONTROLLED MANNER !

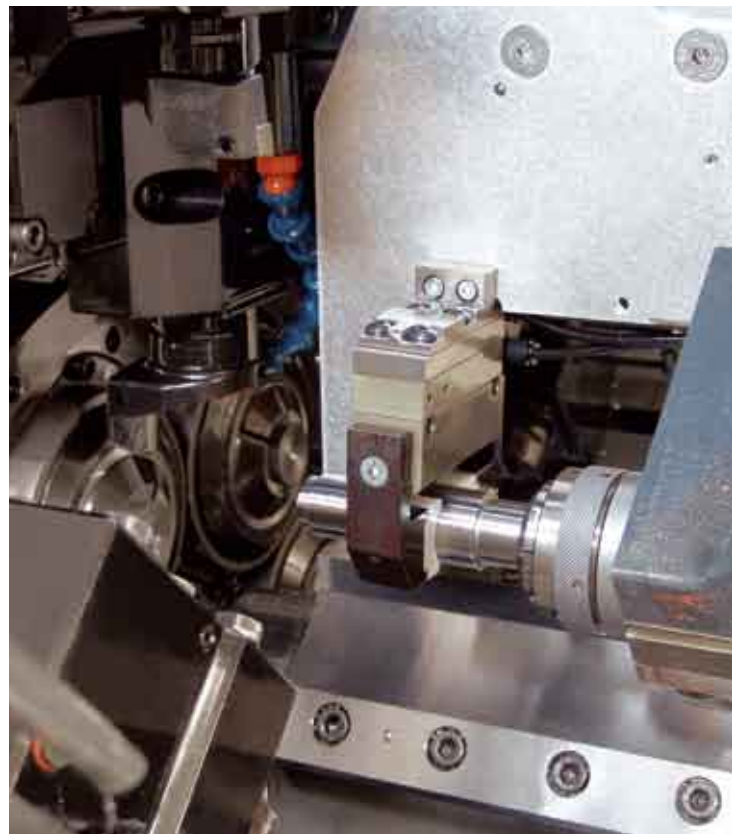
NC-controlled manipulators !

Advantages

- Every component is handled in exactly the same way
- No more damage resulting from collision impacts
- Possibility of transferring components to another machine

This adaptable system can be used for different applications such as :

- Extraction of a workpiece from the machining area to a pre-cleaning area
- For chucker applications, components can be loaded and unloaded by a manipulator



BENEFIT : UNLOADING COMPONENTS IN A CONTROLLED MANNER !

Integrated palletisation



Many leading companies have automated their processes to the maximum extent possible. This has been done for self-evident reasons associated with labour cost and the stringent quality standards now being demanded.

The MultiAlpha 6x32 was developed with a fully integrated palletisation system. In many cases, the palletisation systems on the market are limited at their machine interface level and need to be installed beside the machine, thereby taking up a considerable amount of space. To avoid problems of this nature, Tornos has installed an integrated palletisation unit between the machine and the electrical switch cabinet. This solution avoids the unnecessary loss of space and

optimises the integration process. Large pallets (dimensions 400 x 600mm) have been integrated as standard to increase autonomy.

Advantages

- Palletisation integrated in the machine
- Occupies a reduced floor area

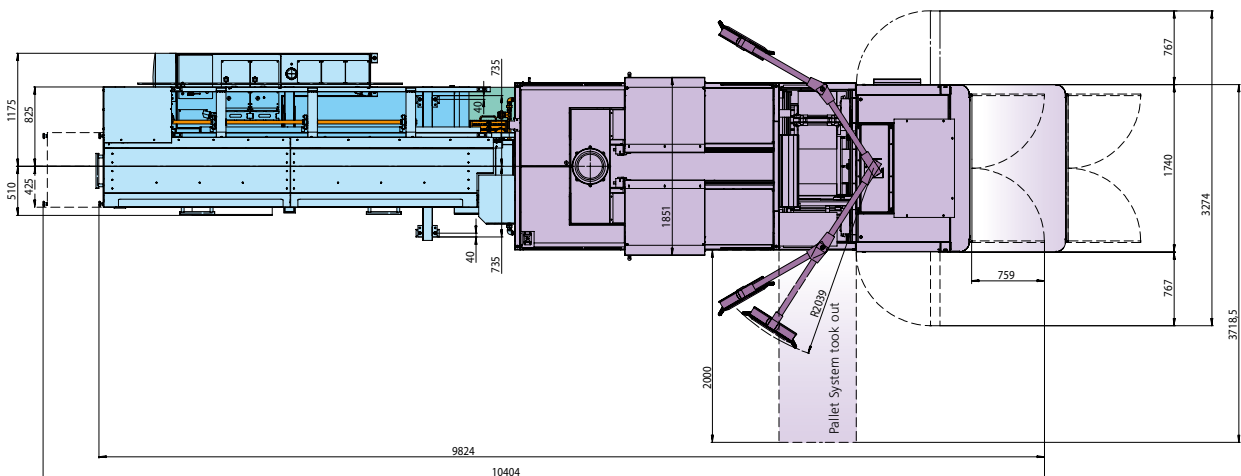
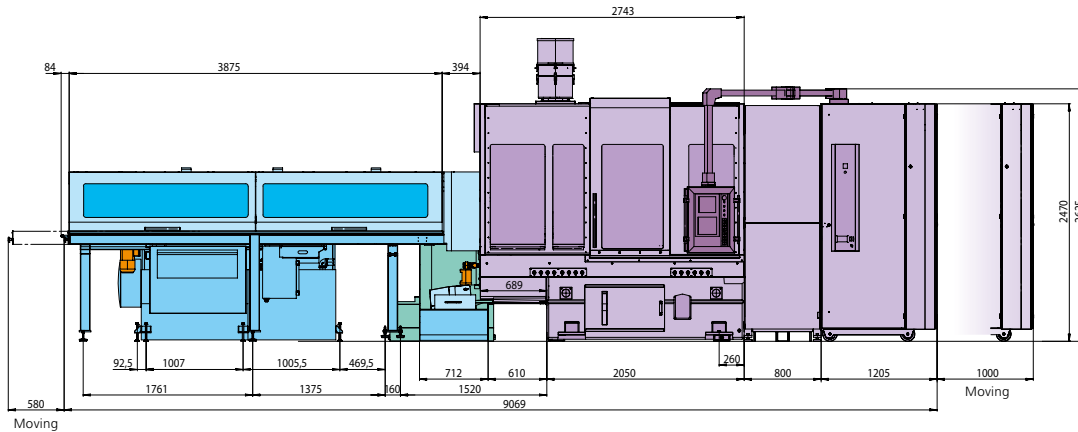
The general concept of palletisation

Once components are loaded on pallets they can be sent directly to a cleaning system, thus enabling them to be integrated in a complete industrial process.

MULTIALPHA 6x32

Main advantages

- Completing complex workpieces
- Delivering ideal cutting speed to each position
- Unloading workpieces in a controlled manner



GENERAL CHARACTERISTICS

Weight (with oil)	kg	~ 11'000
Capacity of oil pan	l	960
Installed power rating	kVA	~ 90
Pneumatic system	bar	6

TECHNICAL SPECIFICATIONS

TECHNICAL SPECIFICATIONS

Bar passage	mm	32 (34)
Max. component length	mm	120

Max. speed of motorspindles	rpm	6'000
Power of motorspindles	kW	13.6
Torque rating of motorspindles	Nm	25 (32.5)

Max. speed of counter-spindle	rpm	8'000
Power of motor / counter-spindle	kW	3
Motor torque of counter-spindle	Nm	8.3 (24)

Max. speed of high-speed motorquill	rpm	8'000
Power rating of high-speed motorquill	kW	6
Torque rating of high-speed motorquill	Nm	7 (9)

Max. speed of high-power motorquill	rpm	6'000
Power rating of high-power motorquill	kW	13.8
Torque rating of high-power motorquill	Nm	14 (18)

Max. speed of tool drive motor for counter-operation	rpm	5'000
Power of tool drive motor for counter-operation	kW	1.4
Torque of tool drive motor for counter-operation	Nm	4.6

Number of slide axes		19
Number of spindle axes		7 (11)
Transverse slide stroke X1, positions 1 to 5	mm	50
Transverse slideway stroke Z1, positions 1, 4 and 5	mm	100
Transverse slideway stroke Z1, positions 2 and 3	mm	80
Stroke of front unit Z2, positions 1 to 5	mm	200
Stroke of cutting slideway X16	mm	40
Stroke of slideway for counter-operation X46	mm	52
Stroke of slideway for counter-spindle Y46	mm	280
Stroke of slideway on counter-spindle Z46	mm	200 (450)
Number of fixed tools for counter-operation		5
Number of rotating tools for counter-operation		3
Cooling of the spindles		Oil
NC unit		Fanuc 30i
Programming system		TB-DECO

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