TORNOS

The evolution of a revolution

EvoDECO range

Productivity and performance

EvoDECO

The EvoDECO range represents the pinnacle of the Tornos offering. Designed for the most demanding machining operations and users, EvoDECO machines are the most powerful and productive on the market. They are available in 4 diameters: 10 mm, 16 mm, 20 mm and 32 mm. Their unparalleled flexibility allows them to efficiently produce the most complex parts while ensuring rapid setup changes.

10 Linear axes
C axes 2
10 mm Maximum diameter
Maximum number of tools 22
9 Maximum number of rotating tools

EvoDECO 10

*B axis 1
10 Linear axes
C axes 2
16 mm Maximum diameter
Maximum number of tools 27
15 Maximum number of rotating tools

EvoDECO 16

10 Linear axes
C axes 2
25,4 mm Maximum diameter
Maximum number of tools 27
15 Maximum number of rotating tools

EvoDECO 20

10 Linear axes
C axes 2
32 mm Maximum diameter
Maximum number of tools 27
15 Maximum number of rotating tools

EvoDECO 32

* Optional: B positioning axis for secondary operation

A design dedicated to optimum productivity

The most efficient machines on the market

Flexibility

The kinematics offered by EvoDECO is totally unique. Today, after almost 20 years and 10,000 machines sold, it should be noted that the kinematics perform just as well.
Currently, no other machine is able to engage as many tools at the same time, and twenty years later Tornos is still the only manufacturer to offer this feat of engineering genius, allowing precious seconds to be saved on this part.
In addition to its kinematics, EvoDECO is equipped with the very latest technologies; the machines all boast an ultra-dynamic powered spindle with a synchronous motor. They offer acceleration and stopping times which are four times quicker, and a constant torque at all speed ranges. This enables more parts to be created for every hour of production. The structure, ballscrews and guides have all been significantly reinforced to make full use of the potential offered by these motorisations. As an option, the EvoDECO 16 can be fitted with a B axis for secondary operation, which allows the user to program any angle without any mechanical adjustment. The time this saves is simply phenomenal. The B axis has three driven positions and a fourth fixed position.

Productivity
- *4 completely independent tool systems.*
- *10 linear axes and two C axes, which are perfectly interpolable.*
- *Ultra-dynamic powered spindles with synchronous motor.*

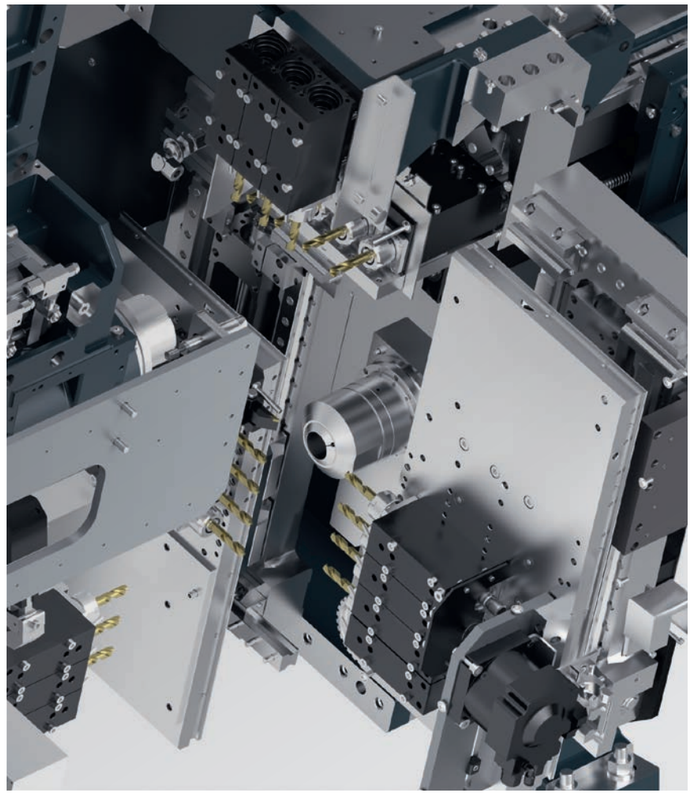
Performance
- *Wide selection of devices and peripherals (compatible with the DECO line).*
- *Continuous temperature stabilisation.*
- *Powered spindles offer high output and torque.*
- *Option to work without guide bush (EvoDECO 16 only).*

Accessibility
- *Simplified programming thanks to the TB-DECO (compatible with the DECO line) or TISIS software.*
- *Huge machining area.*
- *Integration of peripherals.*
- *Ergonomics designed with the operator in mind.*

Autonomy
- *Excellent removal of swarf and cutting oil.*
- *Great machining autonomy without human intervention.*
- *Automatic cyclical lubrication.*
- *Integrated Tornos bar feeder (optional).*

4 independent tool systems

The EvoDECO platform relies on the kinematics which was the key to the DECO platform's success, comprising four independent tool systems and enabling maximum modularity, with the option to engage 4 tools simultaneously in the material (3 in main operation and 1 in secondary operation). It is supported by 4 motorisations for the rotating tools (3 for EvoDECO 10). Advanced machining operations such as roughing and finishing using the guide bush, operation in differential mode (stroke progression) for simultaneous turning and drilling using the guide bush, and secondary operations carried out completely during concurrent operation time are guaranteed by the 10 linear axes and 2 simultaneous C axes.
The concept of the machines has evolved in correlation with market requirements in order to successfully cater to all segments, including the automotive, medical, electronic, watchmaking, micromechanics and aeronautical industries. The innovations are highly pragmatic, with one single aim – to help customers be successful. Optimising the frame, integrating a touch screen computer, increasing the power of the motors, strengthening the guide rails, thermal optimisation of the frame, active temperature stabilisation, powered spindles with synchronous motors, optimising maintenance operations, increasing operator accessibility, adding a B axis, ISO programming, these are just some of the major innovations that are featured in the range.



B axis

Cutting edge technology

A unique piece of equipment

The choice of tool holder system has been made with a view to achieving complete versatility and a very high level of flexibility. All types of tool holders are fitted with a rapid change system and pre-set adaptations. EvoDECO machines are capable of solving all machining problems, with so many possibilities that it would be impossible to list them all. Of course, all DECO accessories can be mounted on these machines to increase their machining capacity. Here are just a few operations and options for the EvoDECO range:

Gear hobbing

EvoDECO machines also specialise in hobbing operations. To meet the needs of the watchmaking industry, the EvoDECO 10 can be equipped with up to 3 hobbing devices, for example.

Thread whirling

Invented by Tornos, thread whirling is one of our specialities. Single, double, main operation or secondary operation, there is a Tornos solution for every need.

Polygon operation

Tulip polygon operation, thread milling, classic polygon operation... all can be performed as main operations or secondary operations.

B axis

Machining of dental implants or any other awkward shape has never been an issue for the EvoDECO. These types of machining can be performed in main or secondary operation modes. As an option, the EvoDECO 16 can be equipped with a B axis, which substantially increases the machining possibilities of the machine. Thanks to these different options, it is possible to fine-tune Tornos machines to adapt them to the requirements of different market segments. The offering is not limited to tool holders; it encompasses high pressure pumps, tap breakage detectors, fire protection systems and even oil mist extraction devices which form part of the suite of options offered as standard by Tornos.

0-10,000 rpm:
0.5 sec

High-performance spindles

Ceramic roller bearings

The fastest and most powerful motors on the market

Currently, the market only uses synchronous technology with axis motors in order to benefit from the accelerations and decelerations necessary to provide the dynamism necessary for machining: EvoDECO machines utilise this technology in the spindle motor too. The efficiency of the synchronous motor exceeds 90%, while that of the asynchronous motor is barely above 80%. In addition to efficiency, the acceleration is also greater: 0 to 10,000 revolutions takes just 0.5 seconds on a synchronous motor compared to 2 seconds on an equivalent asynchronous motor.

This technology allows these machines to boast the fastest accelerations and decelerations ever observed with an automatic turning machine. The torque is constant at any speed. The customer benefits are clear, with increased productivity of up to 30% for a part requiring frequent stoppages. The kinematics of the EvoDECO machine are conducive to a high degree of milling, which often involves frequent stoppages. The spindles and guide bush are equipped with ceramic roller bearings to guarantee thermal stability, precision and durability, even with high loads.

Comprehensive solution

Ergonomics

The wide machining area provides the operator with easy access to the tools and guarantees excellent swarf removal. The control for the bar feeder is integrated directly on the machine's NC to facilitate the programming and use of the EvoDECO.

Autonomy

To increase the machine's profitability, the EvoDECO has been designed to operate for long periods of time without any operator intervention. The preheating system, the independent spindle cooling circuit, automatic swarf filtration and automatic cyclical lubrication all help ensure the autonomy of the EvoDECO.

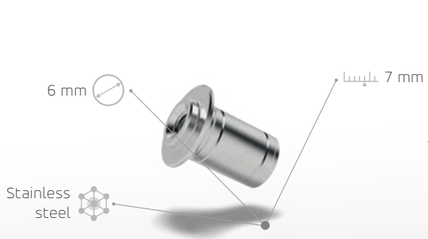
Increased rigidity

The sequence of benefits is logical: the more rigid the machine, the fewer microvibrations it emits during machining, ensuring the tool is more stable. It enters the material cleanly, thereby ensuring an improved surface finish. In addition, the tool benefits from an extended service life, which means reduced machine downtime; this results in increased productivity. EvoDECO machines have all benefited from reinforced rigidity, notably by optimisation of the frame, reinforcement of the guides and replacement of the ballscrews in the machine's various tool systems with elements boasting larger dimensions. The rigidity of EvoDECO machines enables them to exploit the power of the spindles and kinematics to perfection.

EvoDECO 10
Up to 22 tools, including 10 rotating positions

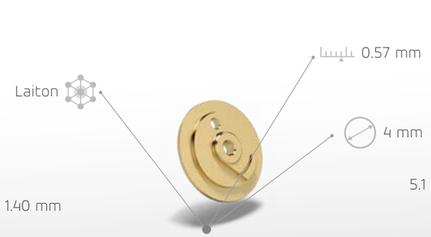
To ensure your needs are fully met, the EvoDECO 10 is available in 2 basic versions equipped with 8 or 10 linear axes. The 10-axis version is equipped with a combined unit (X31/Z31) allowing frontal operations to be performed with ease. The 8-axis version with independent counter spindle can house up to 19 tool positions, including 7 turning positions.

Double or triple hobbing, polygon operation, thread whirling, decoration... nothing is impossible.

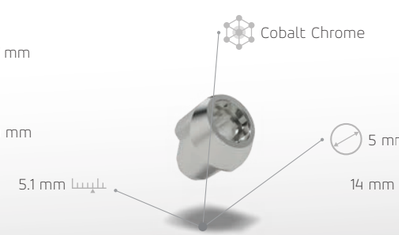


Electronics

Micromechanics



Micromechanics



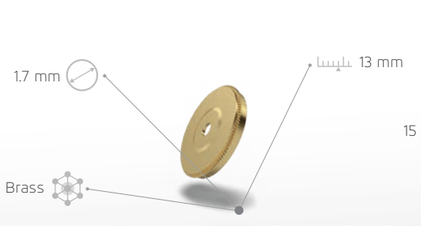
Medical & dental

Automotive

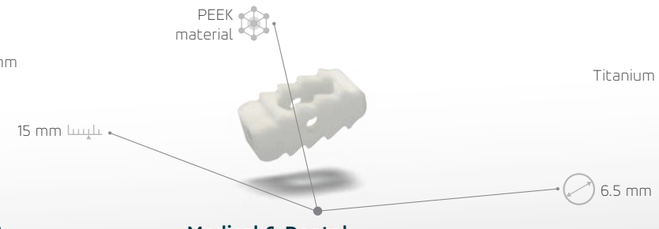
EvoDECO 16
Up to 27 tools, including 15 rotating positions

The EvoDECO 16 boasts four independent tool systems for maximum modularity. The benefits of the EvoDECO 16 include its ability to perform roughing/finishing operations and work in differential mode (stroke progression), as well as the option to perform secondary operations during concurrent operation time.
As an option, the machine can also be equipped with a B-axis in secondary operation.

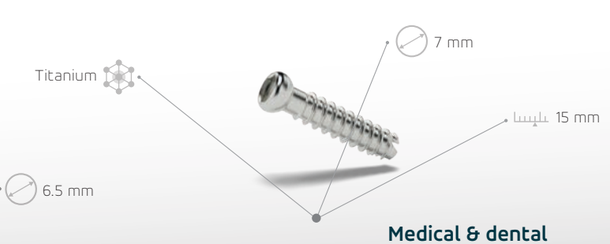
The fully modular machining area offers you a unique level of flexibility.



Micromechanics



Medical & Dental



Medical & dental

Automotive

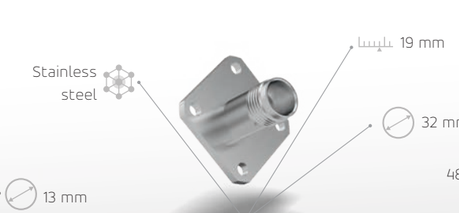
EvoDECO 20 and EvoDECO 32
Up to 27 tools, including 17 rotating positions

These machines benefit from 4 independent tool systems for maximum modularity. It is possible to engage 4 tools simultaneously, i.e. 3 in main operation and 1 in secondary operation. Roughing/ finishing, differential mode (stroke progression) and the option to perform secondary operations during concurrent operation time are just a few of the advantages of these machines.

Power and flexibility for all types of application.

Medical & dental

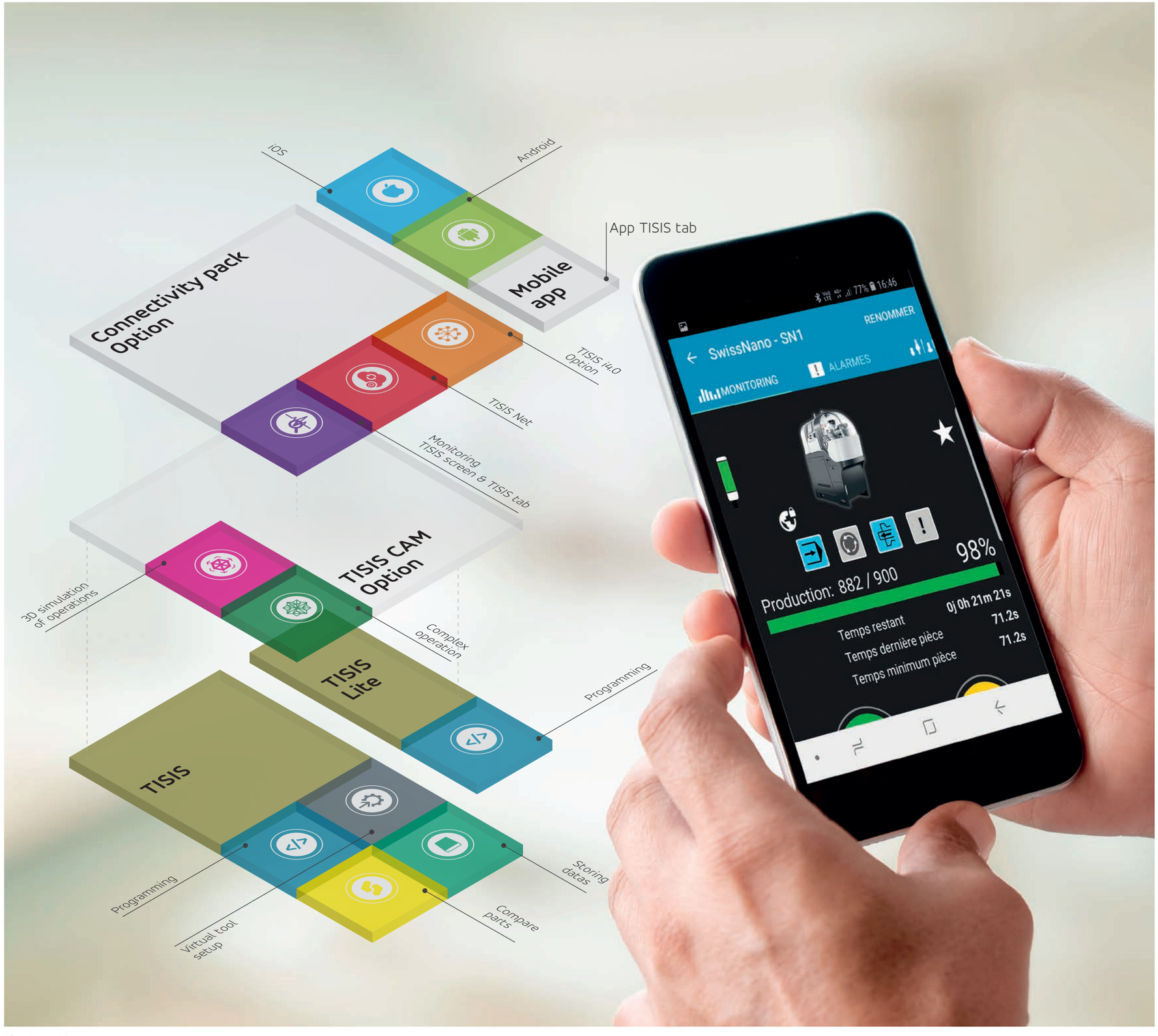
Medical & dental



Electronics

Automotive

Automotive



TISIS and TB-DECO: Programming and communicating with your EvoDECO machine

Experience programming intelligence

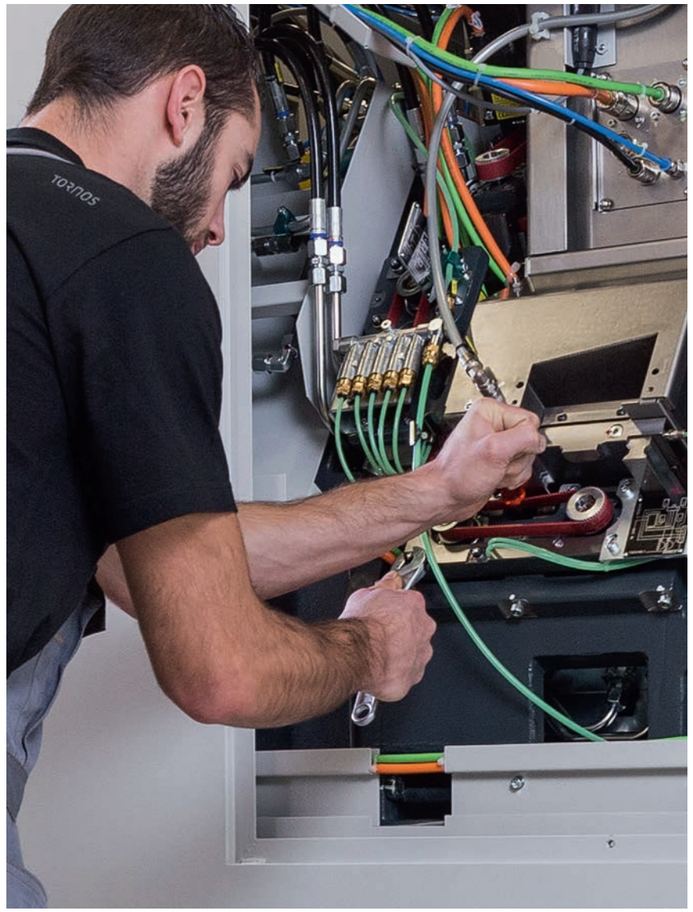
In today's competitive global marketplace, there's not a moment to waste in meeting customers' demands. Our TISIS communication and TB-DECO programming software put you on the fast track to truly effortless programming and real-time process monitoring. But that's not all: TB-DECO enables you to assess each machine's options, reduces the risk of collisions and the resulting downtimes, and improves your production efficiency. TB-DECO is a programming assistance system which generates tables to control the paths of each axis and spindle, firmly based on the operation of a cam-type machine. To enable this, it is equipped with a powerful computer with an integrated interpolator and a machine simulator. The software enables the operator to visually position the operations on a timeline, and to generate a more efficient code for the CNC. It works in the same way as the editing software used by amateur filmmakers, and makes it very easy to position operations in the desired location. Since tools already exist in their database with geometric details, the desired movements just need to be indicated using the ISO code.

Industry 4.0-level

At the same time, TISIS takes the complexity out of process monitoring, enabling you to take your first steps into the Industry 4.0 universe. Even from a remote location, you can keep an eye on the details of the machining process from your smartphone or tablet. The software also enables you to quickly transfer your programs, either by USB key or directly onto the machine via your company network. Your parts designs in various stages of completion can be stored with your program. These can then be easily found in the database using a search function.

Discover the TISIS video

Tornos Service



Backed by both geographical proximity to customers and an in-depth understanding of their processes, applications and market challenges, Tornos Service delivers an unparalleled continuum of support: start-up assistance, expert training and coaching, free hotline, on-site operations support and preventive maintenance, original spare parts seamlessly delivered worldwide, complete overhauls to extend the service life of Tornos machines, and a range of operations and X-change modules to expand customers' application capabilities and profitability.

Buying a Tornos machine is much more than a business transaction. It is your investment in the future. Tornos Service thrives worldwide by guaranteeing the superior production capabilities of products carrying the Tornos name.

Situated close to its customers, as demonstrated by the 14 Tornos Customers Centers strategically located across Europe, Asia, and the Americas, Tornos Service offers a comprehensive range of leading support services for Tornos machines, and encompasses the innovation, reliability and attention to detail expected of a premier Swiss brand. And it is all backed by a 100-year legacy of expertise and in-depth understanding of customers' processes, applications and challenges across a wide range of industrial segments, including automotive, medical, electronics and connectivity, and micromechanics.

Start-up assistance

From the first feasibility tests prior to purchase, you are in good hands with Tornos Service. In our state-of-the-art Techno Centers, expert application engineers support you with tests to gauge the feasibility of machining processes and applications. With start-up assistance, you are secure in the knowledge that you will never be left alone to deal with a brand new machine.

Expert training and coaching

Engineered for intuitive and easy use, Tornos machines offer a vast range of options and enable myriad processes. Expert training and coaching help your employees become specialists proficient in programming, handling and maintenance, adding more value to your processes, applications and products.

Free Hotline support

Wherever you are in the world, highly qualified specialists who speak your language and understand your processes are just a phone call away to quickly support you with handling and programming solutions.

On-site support

Fast, efficient on-site operations and preventive maintenance ensure the continuous high performance of your Tornos machines. Regular scheduled preventive maintenance can help you avoid 70 percent of machine breakdowns and keep you on the path to productivity.

Certified original spare parts

Rapid, reliable, worldwide delivery of certified original spare parts is a speciality of Tornos Service. Regardless of the age of the your Tornos machine, we stock the essential certified spare parts to keep the machine running at peak performance.

Machine overhauls

Tornos machines inspire confidence. It's no surprise, therefore, that many customers turn to Tornos for a complete overhaul of their machines. The Tornos overhaul service returns the machines in good-as-new condition, significantly extending their service life.

Options, upgrades and X-change modules

To help you achieve your manufacturing, productivity and quality objectives, our experts collaborate with you to manage complex machining processes, develop software features for machining complex shapes, design special equipment, and tailor peripherals to your needs. Tornos' X-change modules expand your application capabilities and profitability.

Discover Tornos Service

Technical specifications

TECHNICAL SPECIFICATIONS		**EvoDECO 10/10**	**EvoDECO 10/8**	**EvoDECO 16/10**	**EvoDECO 20**	**EvoDECO 32**
		10 linear axes + 2 C axes 4 independent tool systems	8 linear axes + 2 C axes 3 independent tool systems	10 linear axes + 2 C axes 4 independent tool systems	10 linear axes + 2 C axes 4 independent tool systems	10 linear axes + 2 C axes 4 independent tool systems
Main spindle (Z11/S11/C11)						
Max. bar capacity	mm	10	10	16	25.4	32
Standard workpiece length with guide bush	mm	100	100	180	220	260
Spindle rotation speed	rpm	0 to 14,000	0 to 14,000	0 to 12,000	0 to 10,000	0 to 8000
Spindle power	kW	6.5/10.1	6.5/10.1	9.8/12	9.5 (12.5)	9.5 (12.5)
Max. constant torque	Nm	4.8/6.5	4.8/6.5	12.1/15.8	19.6 (28.8)	19.6 (28.8)
Spindle stoppage time (10,000 rpm to 0)	sec	0.5	0.5	0.7	1	0.8
Mild steel drilling capacity	mm	8	8	10	14	14
Mild steel tapping capacity		M6	M6	M10	M12	M12
Guide bush holder (X11/Y11) (X21/Y21/S21)						
Number of tool positions on guide bush		8/2 x 4	8/2 x 4	10/2 x 5	10 (5 + 5)	10 (5 + 5)
Turning tool section		8 x 8	8 x 8	12 x 12/12.7 x 12.7	16 x 16	16 x 16
Positions for rotating tools		4	4	6/2 x 3	max 6 (4 in S21 + 2 in S12)	max 6 (4 in S21 + 2 in S12)
Rotating tool speed of rotation	rpm	100 to 12,000	100 to 12,000	100 to 8,000	100 to 8,000	100 to 8,000
Rotating tool power	kW	1.1	1.1	0.55/1.1	1.5-2.2	1.5-2.2
Steel drilling/rotating tool capacity	mm	4	4	8	8	8
Rotating tool/steel tapping capacity		M4	M4	M6	M6-M8	M6-M8
End attachment (X31/Z31/S31)						
Number of tool positions		3	-	4	4	4
Positions for rotating tools		3	-	3	3	3
Rotating tool speed of rotation	rpm	100 to 12,000	-	100 to 8,000	100 to 6000	100 to 6000
Rotating tool power	kW	1.1	-	0.55/1.1	1.5-2.2	1.5-2.2
Steel drilling/rotating tool capacity	mm	4	-	8	8	8
Rotating tool/steel tapping capacity		M4	-	M6	M6	M6

TECHNICAL SPECIFICATIONS		EvoDECO 10/10	EvoDECO 10/8	EvoDECO 16/10	EvoDECO 20	EvoDECO 32
Counter spindle (Z41/Y41/S41/C41)						
Max. bar capacity	mm	10	10	16	25.4	32
Insertion length of workpiece into spindle	mm	100	100	150	150	150
Spindle rotation speed	rpm	0 to 14,000	0 to 14,000	0 to 12,000	0 to 10,000	0 to 8000
Spindle power	kW	5.1/7	5.1/7	9.8/12	9.5 (17.8)	9.5 (17.8)
Max. constant torque	Nm	3.4/4.8	3.4/4.8	12.1/15.8	15.1 (19.6)	15.1 (19.6)
Stoppage time (10,000 rpm to 0)	sec	0.5	0.5	0.7	1	0.8
Mild steel drilling capacity	mm	6	6	10	14	14
Mild steel tapping capacity		M6	M6	M10	M12	M12
Secondary operation (X41/S42)						
Number of tool positions		4	4	6	7	7
Positions for rotating tools		4	4	6	3	3
Rotating tool speed of rotation	rpm	100 to 9,000	100 to 9,000	100 to 8,000	100 to 8,000	100 to 8,000
Rotating tool power	kW	1.1	1.1	1.5/2.2	1.5-2.2	1.5-2.2
Steel drilling/rotating tool capacity	mm	4	4	8	8	8
Rotating tool/steel tapping capacity		M4	M4	M6	M6	M6
Max. total number of tools		22	19	27	27	27
Operation/secondary operation tool distribution		18/4	15/4	19/8	19/8	19/8
B positioning axis (optional) for secondary operation						
Number of rotating tools				3		
Max. spindle speed	rpm			0 to 8000		
100%/40% power	kW			1.5/2.2		
Torque	Nm			4.77/7		
Collet				ER/ESX 12		
Max. clamping capacity	mm			7		
Adjustment possibility	degrees			0 to 90		
B axis resolution	degrees			0.001		

BASIC MACHINE EQUIPMENT	EvoDECO 10/10	EvoDECO 10/8	EvoDECO 16/10	EvoDECO 20	EvoDECO 32
Rotating guide bush	●	●	●	●	●
S21 rear platten rotating tool motor	●	●	●	●	●
S31 end attachment rotating tool motor	●	—	●	●	●
S42 rotating tool motor in secondary operation	●	●	●	●	●
C11 + C41 axes	●	●	●	●	●
Interpolation in polar coordinates	●	●	●	●	●
Fine adjustment of the counter spindle clamping force (S41)	●	●	●	●	●
Pneumatic ejection of workpiece and oil cleaning of collet	●	●	●	●	●
Automatic centralised lubrication cycle	●	●	●	●	●
Stack light (4 colours)	●	●	●	●	●
Cooling pump with self-cleaning filter	●	●	●	●	●
Timer for preheating cutting oil	●	●	●	●	●
Fire extinguisher interface	●	●	●	●	●
Bar feeder interface and connection tube	●	●	●	●	●
TB DECO ADV programming software	●	●	●	●	●
TISIS programming software	●	●	●	●	●

Numerical control

Control type	Fanuc 31i-B5	Fanuc 31i-B5	Fanuc 31i-B5	Fanuc 31i-B5	Fanuc 31i-B5
Number of simultaneous axes	all axes	all axes	all axes	all axes	all axes
Number of interpolable axes	all axes	all axes	all axes	all axes	all axes
Encoder/axis motor technology	absolute serial	absolute serial	absolute serial	absolute serial	absolute serial
Motor type (axes and spindles)	synchronous (AC)	synchronous (AC)	synchronous (AC)	synchronous (AC)	synchronous (AC)
Axis resolution	0.1 mu	0.1 mu	0.1 mu	0.1 mu	0.1 mu
19” colour touch screen and removable operator console					

Programming software

Programming software using ISO language	TB DECO ADV	TB DECO ADV	TB DECO ADV	TB DECO ADV	TB DECO ADV
Calculation of actual machining time					
graphic simulation of the program					

General specifications

Max. length	mm	1870	1870	1900	2289	2289
Max. width	mm	1140	1140	1470	2070	2070
Max. height	mm	1850	1850	2460	2580	2580
Weight	kg	1650	1650	2700	approx. 3800	approx. 3800
Cutting oil tray capacity	l	200	200	200	220	220
Coolant pump power	kW	0.75	0.75	0.75	1.1	1.1
Max. pressure	bar	5	5	5	5	5
Coolant pump flow rate	l/min	27.6	27.6	27.6	43	43
Colours: RAL 9006 grey, RAL 9011 black						
CE/EMC certified						

● Standard O Optional — Not available

A global footprint

Rooted in Switzerland, Tornos' global footprint keeps us close to you. Economy, flexibility and efficiency are the most important premises of the Tornos Group's production and assembly network.

Lean assembly and careful use of resources are the guiding principles behind all Tornos production planning and an integral part of the entire production process.

The same consistent quality standards are enforced at all locations around the globe. Intelligent linking of knowledge between our plants, along the commitment and know-how of our employees—enable production to begin right on time.

Wherever you are in the world, we keep you turning.

La Chaux-de-Fonds
Tornos La Chaux-de-Fonds is renowned for its high-quality bespoke solutions in the field of micro-milling. We create turnkey solutions to your technical specifications.
Each machining centre has its own characteristics when it leaves the production plant.

Xi'an
Our Xi'an, China site's special testing and development center allows it to fit out machines to customer specifications. In Xian, we produce standard products delivering great value for the money on a global scale.

Moutier
Our Moutier site—using the latest production technologies and equipment—produces the key components of our world-renowned machines and assembles our high-end automatic turning machines and other multispindle solutions. Key components stamped "made in Switzerland" are produced in Moutier for all of our production sites.

Taichung
In Taichung, Taiwan—a city with a long machine tool-making tradition and broad network of suppliers—Tornos produces mid-range machines. Our Taichung facility's services include customization, setup, designing models, and on-site testing of machines produces. Key components of our machines produced in Taichung are sourced from our Moutier production site.

We keep you turning

tornos.com

TORNOS SA

Rue Industrielle 111
CH-2740 Moutier
Tel. +41 (0)32 494 44 44
contact@tornos.com

Tornos
throughout
the world

MT

Complies with current CE/EMC safety directives