

# TORNOS

TORNOS  
SwissDECO 36

*Taking performance  
to new heights*

SwissDECO

*A range of machines finely tuned to suit your needs*

## SwissDECO

*Tornos' SwissDECO range offers no fewer than three machines, available in a choice of two diameters: 25.4 mm and 36 mm. All equipped with three independent tool systems, SwissDECO machines are designed to provide exceptional operating flexibility, while remaining extraordinarily user-friendly. The SwissDECO range distills more than 100 years of experience into a single machine: More than simply a machine range, this is Tornos' vision of the future of bar turning.*



9 Linear axes  
 C axes 2 1 A axis\*  
 Maximum number of tools 38 27 Maximum number of rotating tools

SwissDECO G

⌀ Max diameter: 25.4 mm, 36 mm  
 📏 Standard workpiece length: 200 mm

9 Linear axes  
 C axes 2 1 B axis\*  
 Maximum number of tools 57 36 Maximum number of rotating tools

SwissDECO T

⌀ Max diameter: 25.4 mm, 36 mm  
 📏 Standard workpiece length: 200 mm

\* Option

# Flexibility and power

## Easy ejection of long parts

The range comprises different versions to effectively meet the needs of the market. The SwissDECO is designed for the market's most demanding applications in all business sectors. Enabling ideal bar turning with the fewest possible constraints, the SwissDECO is cost-effective on simple parts while allowing users to easily produce even the most complex parts.

### Flexibility

- Three different kinematic systems to meet any challenge
- Available in two diameters: 25.4 mm and 36 mm
- Huge range of tool holders
- Long travel enabling constraint-free machining
- Easy ejection of long parts
- A axis or B axis to meet any challenge
- Deep drilling thanks to the Z2 axis
- High performance counter operations tool system
- Self-adjustable 3 positions guide bush

### Precision

- Maximum precision and excellent thermal behavior
- Ultra-rigid structure enabling the most extreme machining operations
- Hydraulic brake available as an option on the 36 mm version
- Motorized guidebush
- Ceramic ball bearings

### Productivity

- The 36 mm version has the most powerful spindles on the market, offering torque of 54 Nm.
- Capable of machining with machining parameters for the fixed headstock
- Up to three tools in the material
- The turret with torque motor indexing enables very short tool changeover times.
- Spindle and back spindle have the same power, allowing operations to be optimally balanced.
- Work with or without guide bush
- TISIS optimove, improvement of the cycle time and reduction of the energy consumption

### Easy to use

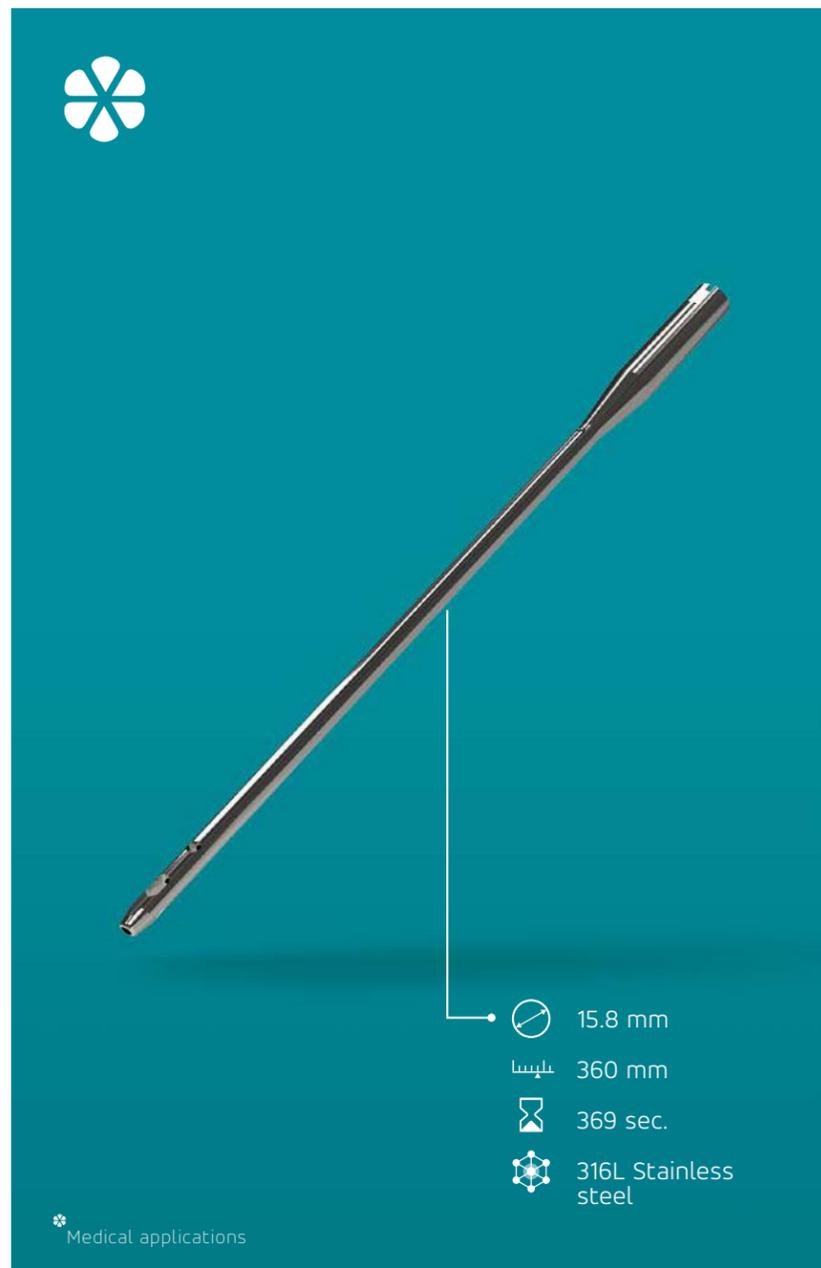
- Unrivalled accessibility
- Possibility to preset tools
- Quick tool change system available in option
- Maintenance free

### A complete, easy-to-use solution

With the SwissDECO, Tornos has created the ideal bar turning machine with the fewest possible constraints: It is cost-effective on

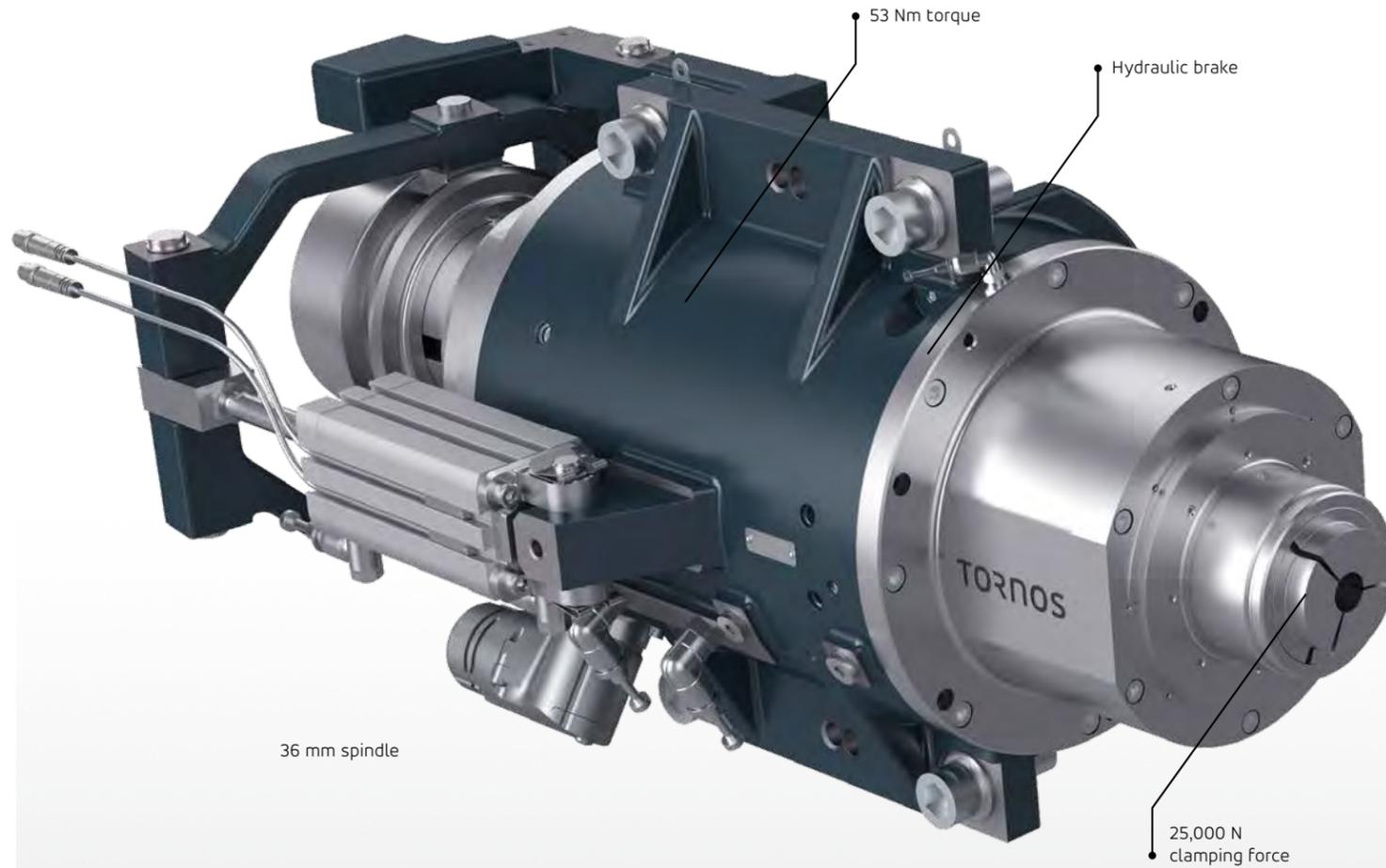
simple parts and allows users to easily produce even the most complex parts.

Each detail has been analyzed to make the machine as ergonomic and easy to use as possible. For example, the easy fluid system reduces downtime to zero. Programming and use are also made virtually effortless, thanks to TISIS "optimove" and the new console. This patented system allows the ideal tool path to be precalculated in order to optimize the cycle time without human intervention.



# The heart of our expertise

## Ceramic bearings



Combined with the rigid structure, the power of the spindles makes the SwissDECO the only sliding head machine on the market capable of production with the machining parameters characteristic of the fixed headstock.

### A choice of two spindles: 25.4 mm and 36 mm

The SwissDECO 26 and its 25.4 mm liquid-cooled spindles can reach 10,000 rpm in a few tenths of a second; the spindles are identical for main and secondary operation and therefore have the

same characteristics. With a clamping force of 14,000 N, the spindles provide torque of 27 Nm. These spindles also guarantee dynamism in addition to power. They are equipped with ceramic bearings to guarantee thermal stability, precision and durability, even with high loads.

### SwissDECO 36: 36 mm and astonishing power

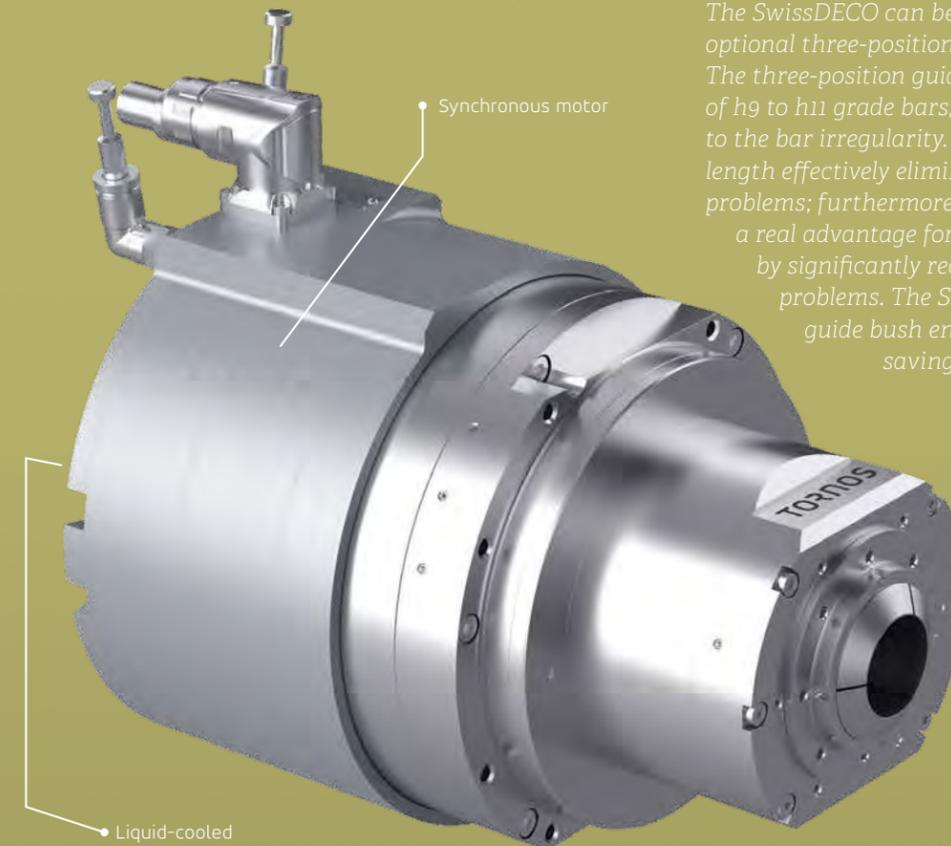
The SwissDECO 36 is equipped with 36 mm spindles. The clamping force is 25,000 N, with a maximum rotation speed of 8,000 rpm.

## Conversion < 15 minutes

The new spindles benefit from the latest motor technology, enabling them to develop impressive torque of 53 Nm which guarantees phenomenal chip removal. As on the 26 mm version, these spindles are equipped with ceramic bearings and benefit from liquid cooling. It is also possible to use a biconical collet for main operation and a wide opening collet for secondary operation if necessary.

In these two configurations, the SwissDECO can be equipped with a guide bush incorporating a synchronous motor and ceramic bearings; it allows the full potential of the SwissDECO spindles to be exploited. The direct drive also improves the part's final finish. The guide bush can be readily removed and secured on a support to allow operation without a guide bush, and with no need to disconnect the cable or pipe. Conversion can be efficiently carried out in under 15 minutes.

The SwissDECO can be equipped with an optional three-position motorized guide bush. The three-position guide bush allows for the use of h9 to h11 grade bars, adjusting automatically to the bar irregularity. The substantial clamping length effectively eliminates bar marking problems; furthermore, this system also offers a real advantage for milling operations by significantly reducing vibration problems. The SwissDECO's three-position guide bush enables significant material savings.

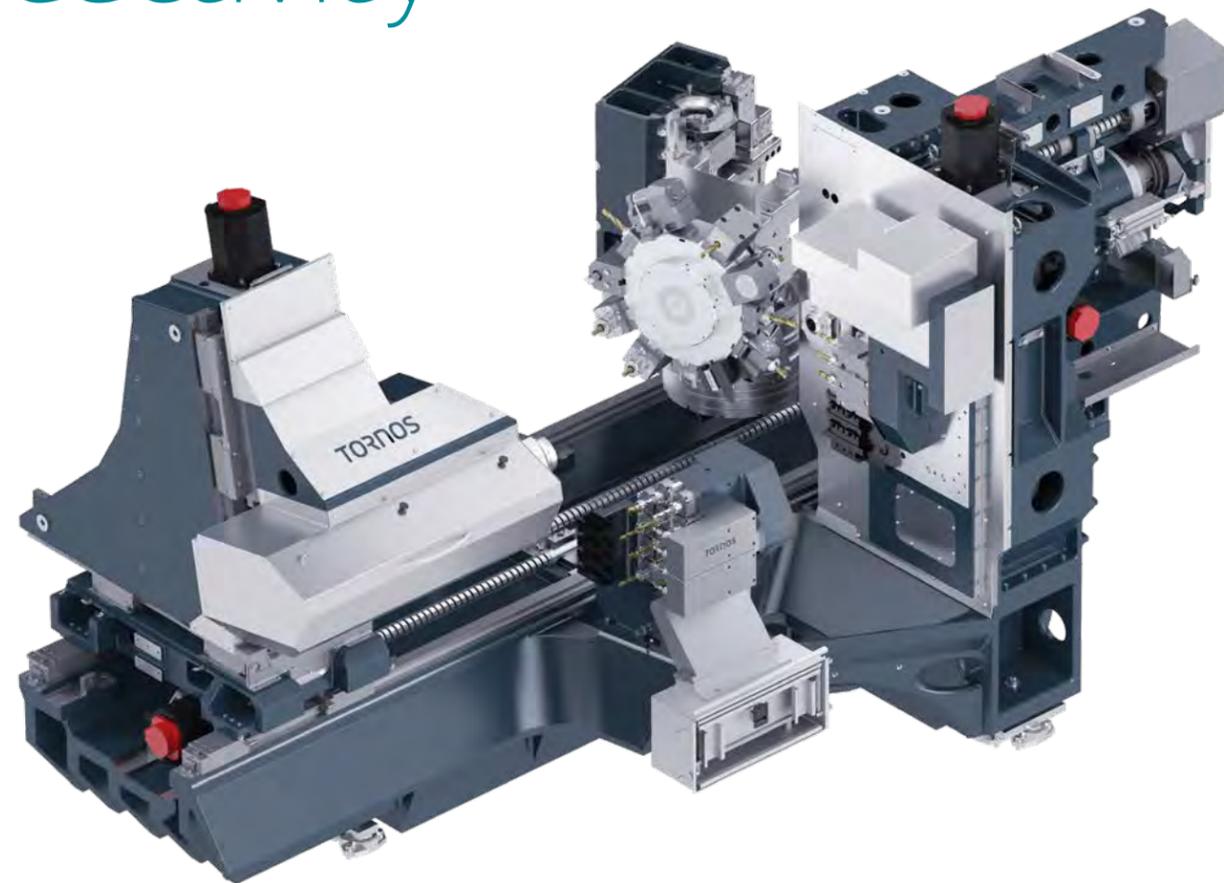


## Three-position guide bush\*

\* Option

# Rigidity and high performance

## Unlimited productivity



### Structure

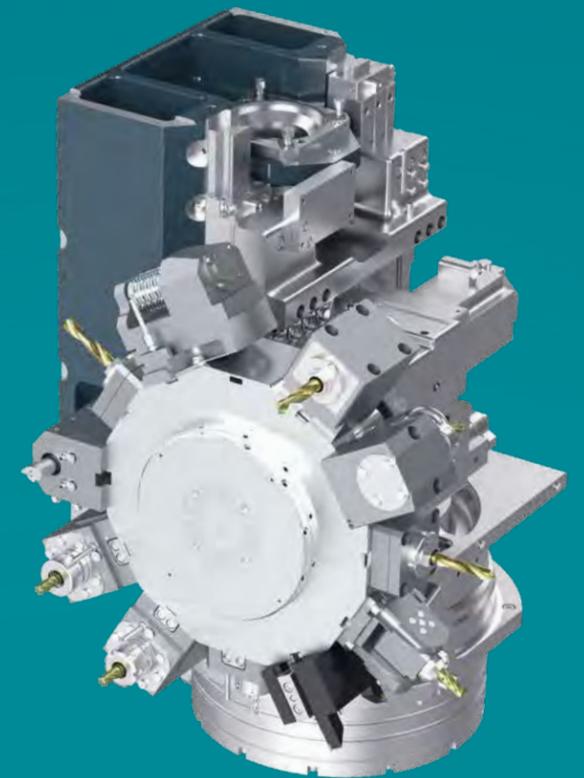
The SwissDECO's structure, calculated using finite element analysis, is designed to guarantee perfect machining quality and unrivaled performance. It enables you to perform the most demanding machining operations while guaranteeing excellent quality. The tool wear rate and machining quality are directly linked to the machine's rigidity. On the SwissDECO, it is no longer necessary to

prioritize bar machining operations to optimize the machining quality and autonomy. Three times more rigid than its competitors, the SwissDECO offers machining performance which is unprecedented on a sliding headstock lathe. The power and kinematics of the SwissDECO offer an alternative to a fixed headstock turning center, while retaining the advantages of the sliding headstock.

## 30°/180° indexing in 0.2 seconds

The 12-position turret on the SwissDECO can accommodate up to three tools per position. It is easy to use and multiplies the machine's tool storage capacity. The turret is positioned in place of the rear platten. Whatever the final choice, these two devices feature X and Y movement capability, and are also equipped with a Z axis enabling them to work in differential mode, for example. Indexing is performed using a torque motor, which guarantees very short chip-to-chip times. Only the tool in the machining position is driven. It operates quietly, and benefits from integral cooling, ensuring perfect thermal stability.

The turret can be mounted on a B axis as an option, allowing angular positioning of the turret. Five-axis simultaneous machining is available as an option for producing the most complex shapes. Conscious of the importance of reducing setup times, Tornos designed the SwissDECO turret, which can be equipped with a quick clamping system. The tool holder can be locked onto and released from the turret using a single screw. In addition to the significant time savings this system offers, it also guarantees excellent repeatability and high concentricity.



Turret on the B axis

### A axis

The A axis can be adapted to each SwissDECO G machine to take it to a new level; it can also be equipped with up to seven additional tools. The extremely rigid A axis rotates over 360 degrees, has no angular limit and can therefore operate equally well with its two sides in main and secondary operation.

## Machining with five simultaneous axes



A axis

# Stay ahead of the curve



## Modular multi-tool concept

The highly versatile, pre-adjustable, quick-change tool holder system developed for the SwissDECO makes full use of the ingenious kinematics. The machine turret can hold up to three tools in each position, making it incredibly flexible. Cooling integrated into the tool holder enables optimal coolant management.

## Quick change

The SwissDECO can also be equipped with a quick-change system, allowing changes to be made in just a few seconds using a single screw. The system can also be adapted to the turret. Offering repeatability to 5 microns, the system guarantees quick setup times and enables the use of a presetting device if necessary.

## Gear hobbing

SwissDECO machines specialize in hobbing operations. To meet the needs of the automotive industry, the SwissDECO can be equipped with a hobbing device for both main and secondary operation.

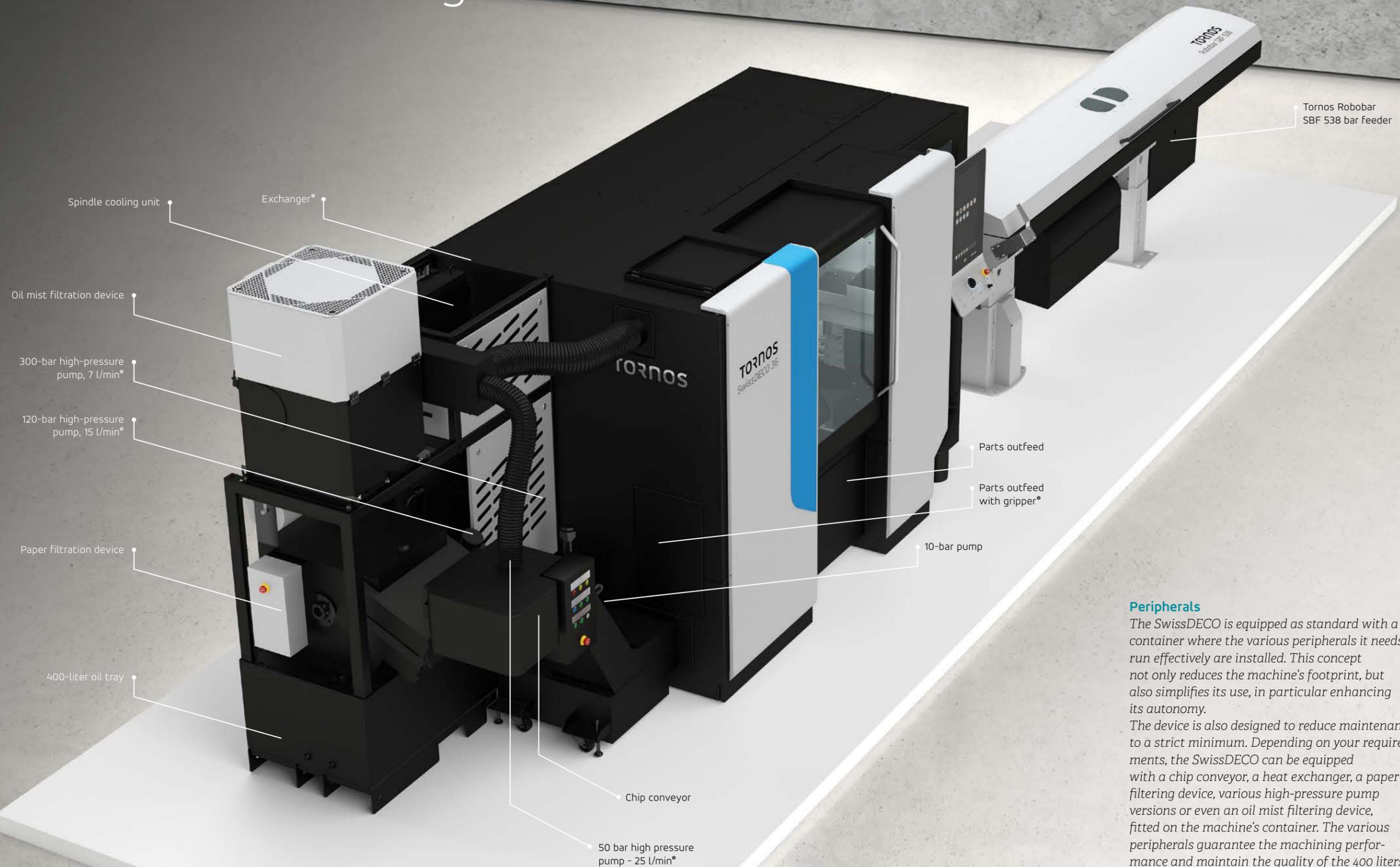
## Thread whirling

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.

# Seamless integration



## Peripherals

The SwissDECO is equipped as standard with a container where the various peripherals it needs to run effectively are installed. This concept not only reduces the machine's footprint, but also simplifies its use, in particular enhancing its autonomy.

The device is also designed to reduce maintenance to a strict minimum. Depending on your requirements, the SwissDECO can be equipped with a chip conveyor, a heat exchanger, a paper filtering device, various high-pressure pump versions or even an oil mist filtering device, fitted on the machine's container. The various peripherals guarantee the machining performance and maintain the quality of the 400 liters of cutting oil at a constant level, preventing the formation of sludge or the buildup of chips.

\* Option

# Continuous flexibility

Maximum speed  
10,000 rpm

*There are three versions of the SwissDECO machine, allowing you to choose the best possible kinematics for your specific needs. Each of these configurations has three fully independent tool systems. All configurations are equipped with the same secondary operation block. The three-axis back spindle facilitates management of the machine's setup and settings.*

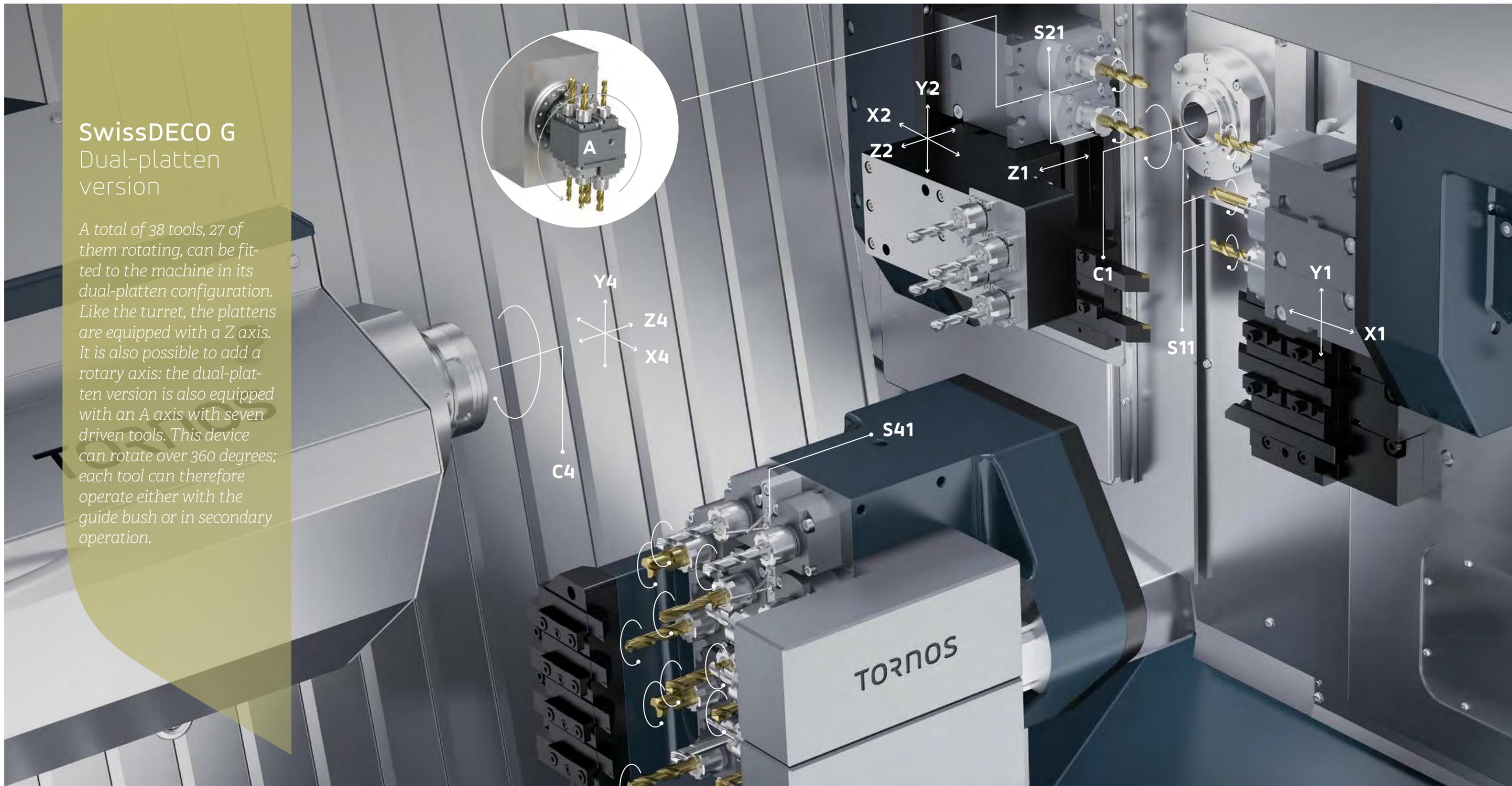
*The SwissDECO features an extremely rich and ultra-rigid secondary operation block: quite simply the best endowed on the market. A total of 16 tools, 12 of which are rotating, can be fitted to the machine. In order to form a coherent assembly, the secondary operation block has extremely high drive power. The tools drive alone features torque of 8.2 Nm, providing a maximum rotation speed of 10,000 rpm.*

The most powerful  
secondary operation device  
on the market

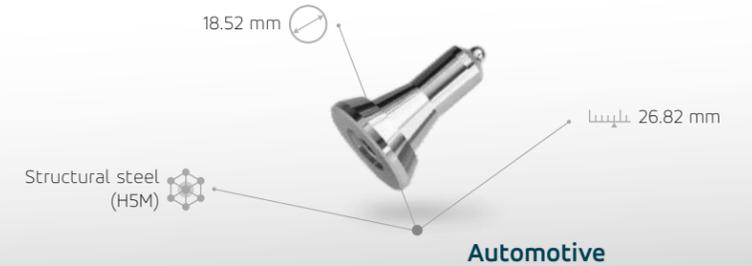
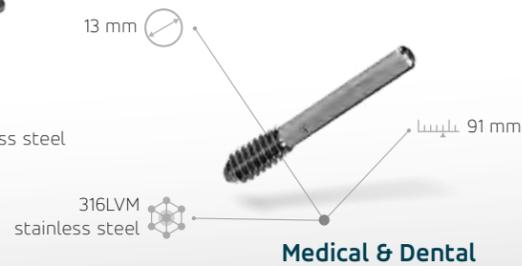


## SwissDECO G Dual-platten version

A total of 38 tools, 27 of them rotating, can be fitted to the machine in its dual-platten configuration. Like the turret, the plattens are equipped with a Z axis. It is also possible to add a rotary axis: the dual-platten version is also equipped with an A axis with seven driven tools. This device can rotate over 360 degrees; each tool can therefore operate either with the guide bush or in secondary operation.

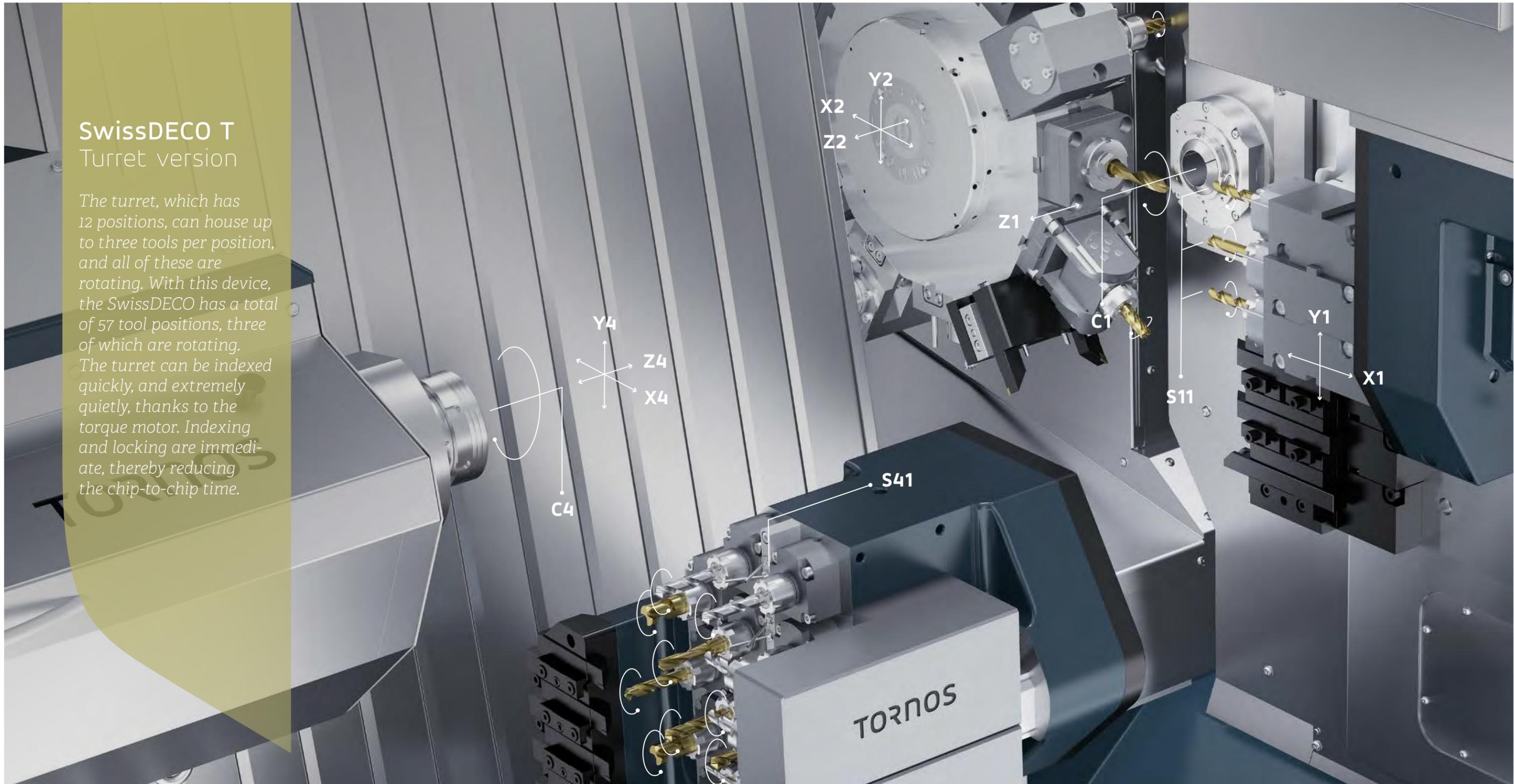


With its dual-platten kinematics, the SwissDECO G guarantees your productivity.

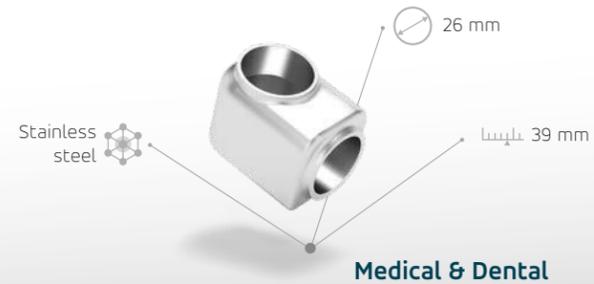


## SwissDECO T Turret version

The turret, which has 12 positions, can house up to three tools per position, and all of these are rotating. With this device, the SwissDECO has a total of 57 tool positions, three of which are rotating. The turret can be indexed quickly, and extremely quietly, thanks to the torque motor. Indexing and locking are immediate, thereby reducing the chip-to-chip time.

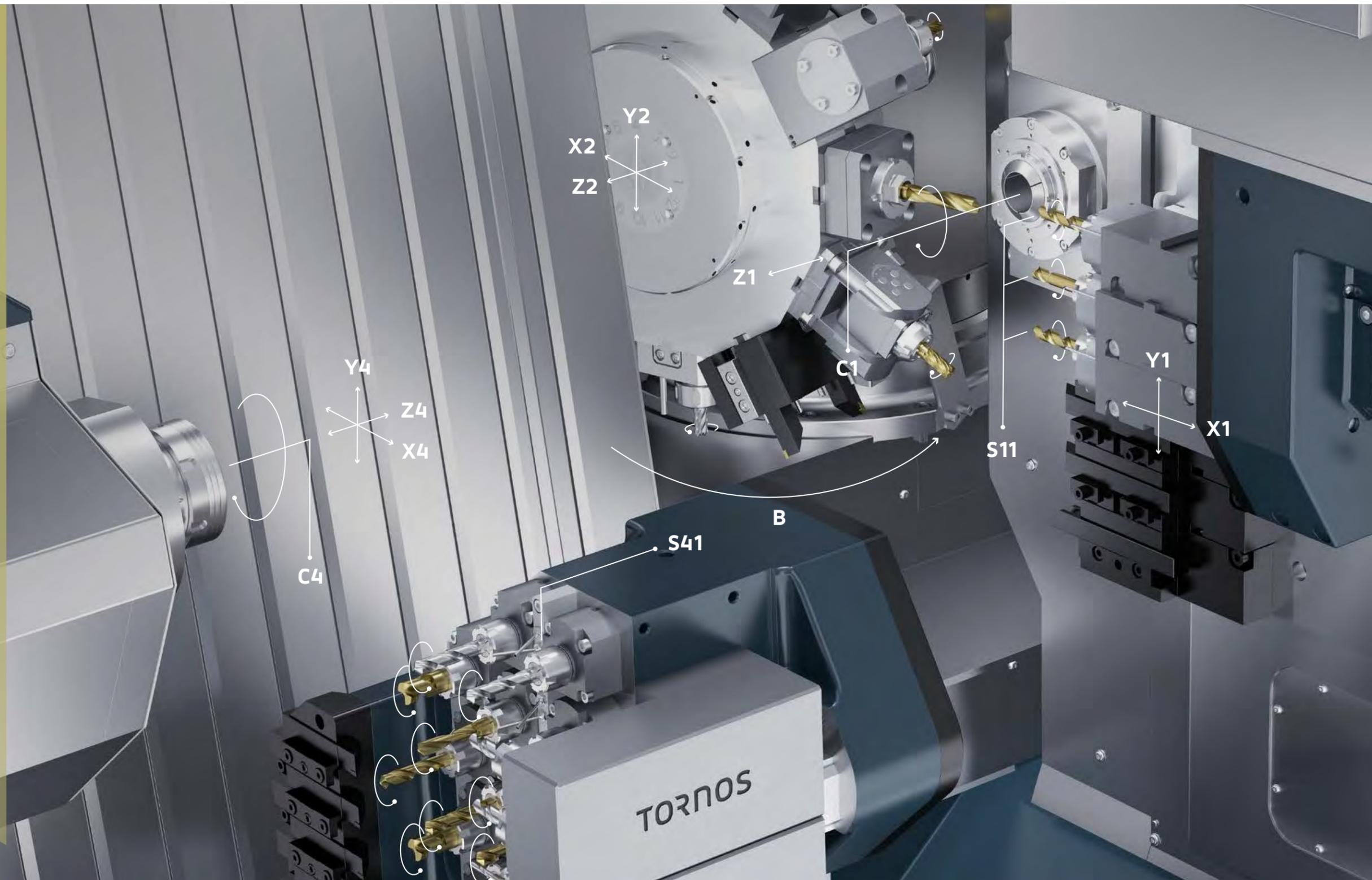


Ready to meet any challenge.

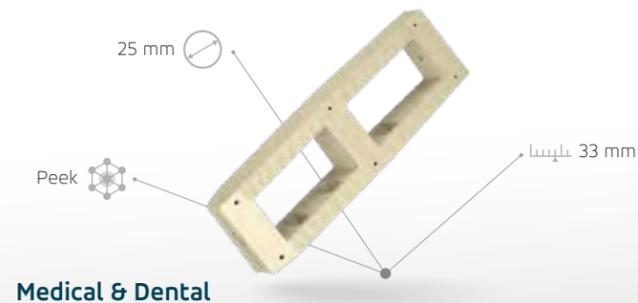


## SwissDECO TB Turret on B axis version

The turret option can also be complemented by a B axis. Just like the A axis, the B axis is available either as a positioning axis or as a version with five simultaneous axes to enable complex shapes to be created. The SwissDECO keeps the same tool capacity, with 57 tool positions, 36 of which are rotating positions.



Unlimited  
flexibility.



# Cycle time optimization

The SwissDECO is the first Tornos solution to feature a new human/machine interface (HMI) console, which greatly simplifies use and programming of the machine for the operator. The machine is programmed in ISO code using our TISIS software, which has been especially adapted to

efficiently manage the three tool systems. Tool settings and adjustments are entirely numerical (all the tools are mounted on three axes). TISIS "optimove" has also been unveiled on the SwissDECO: This patented system allows the ideal tool path to be precalculated to optimize the cycle time. In today's competitive global marketplace, there's not a moment to waste in meeting customers' demands. TISIS "optimove" can reduce the cycle time by up to 30 percent while minimising mechanical effort, heating and wear. All paths are created "just in time." Why accelerate and brake sharply if a smooth, fluid movement that preserves energy and protects the mechanism is possible?

This optimization software does not require any prior knowledge: It is managed automatically when a program is started. In addition, TISIS "optimove" optimizes the axis travel and eliminates unnecessary checks depending on the cycle operation and machine equipment.

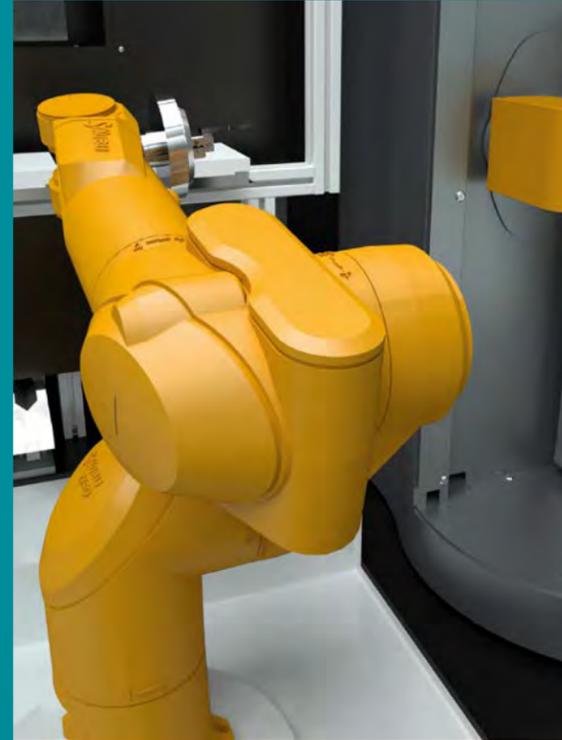
The process also offers energy savings of up to 10 percent, enabling optimal use of the SwissDECO in your workshop. The energy savings can be even greater when the following modes are used:

- Machine sleep mode
- Machine sleep mode and preheating
- Machine shutdown

Sleep mode offers energy savings of up to 75 percent, while programmed shutdown completely cuts the machine's power consumption.



# Automation



## Part gripping device

The part pickup device (linear axis controlled in Z direction) is used to pick up finished parts using a gripper on a parts conveyor. It then discharges the parts outside the machining area on the left side of the machine. The finished part can then be picked up by another device.

## Classic automation

The SwissDECO is Industry 4.0 ready, in particular thanks to the TISIS software. However, the machine has been designed from the outset to integrate automation solutions, a key element of numerical production. Each machine can be equipped with a standardized solution or a specific automation solution, for a modular production system:

- Standard automation
- Handling of parts and pallets
- Easy adaptation to the different part shapes
- Optimal, pre-tested adaptation

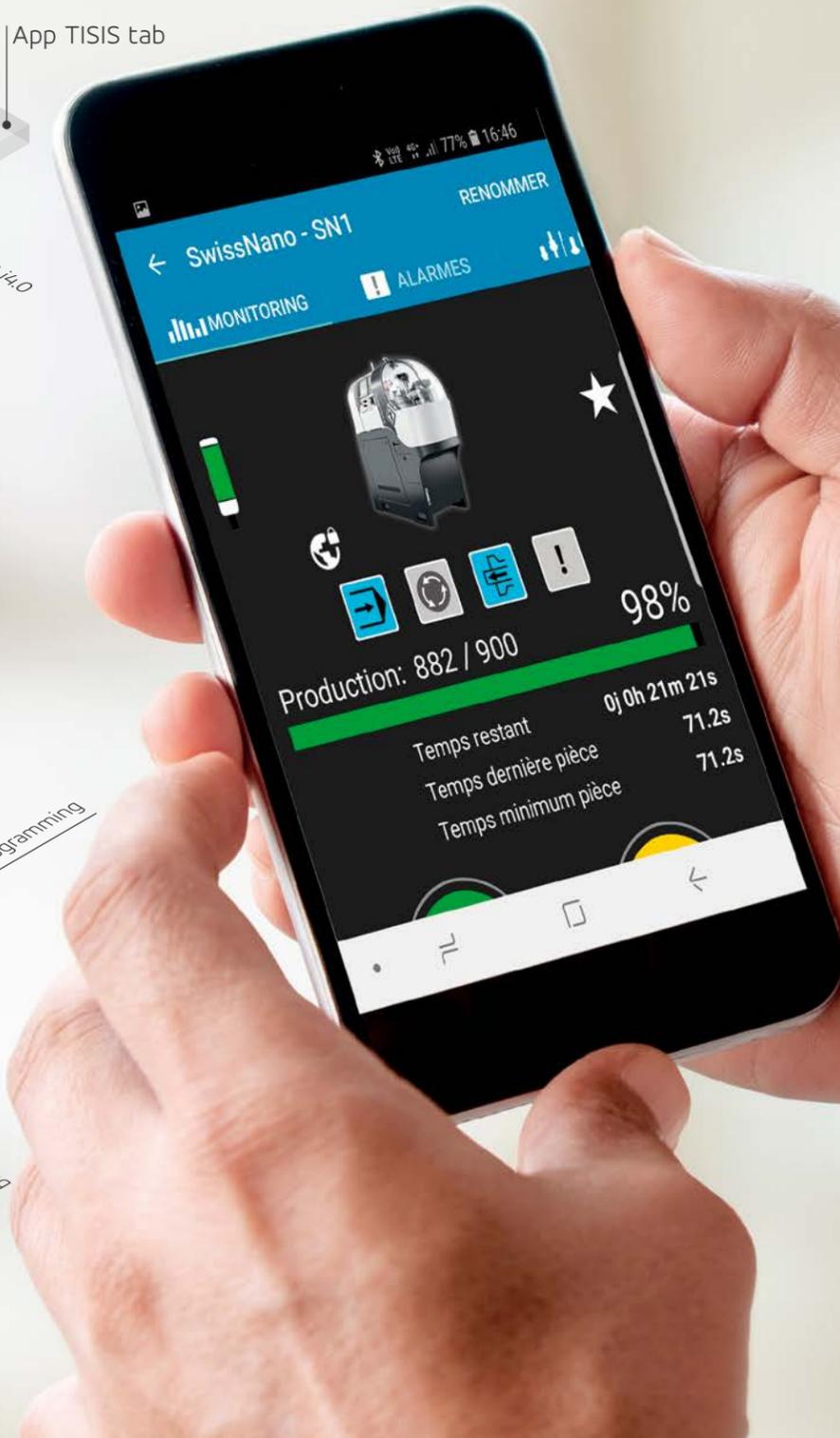


We can also help if you're looking for more than the standard solution: Our customized automation solutions and specialists can support you in your projects.

- Customized solutions and cell automation
- Turnkey solutions
- Integration of process-related peripheral equipment (measuring, cleaning, etc.)
- Optimized solutions tailored to your needs

# Industry 4.0 ready

# TISIS: programming and communication for your SwissDECO machine



## Experience programming intelligence

Our TISIS communication and programming software puts you on the fast track to truly effortless programming and real-time process monitoring. TISIS knows your Tornos machine fleet and can help you decide which machine to use for a specific part. But that's not all: TISIS enables you to assess each machine's options, reduces the risk of collisions and the resulting stoppages, and improves your production efficiency. TISIS is a smart and advanced ISO code editor that does the thinking for you. It knows your Tornos machine fleet, can help you write your code, and points out any coding errors. It puts the code in colour and can display your program in a simple-to-read Gantt diagram, making it easy for you to see the critical path and react quickly to optimize the process. As an option, it is also possible to use our smart TISIS CAM solution, designed to help you master your Tornos machine when it comes to complex and very complex parts. TISIS CAM significantly reduces setup time and, coupled with TISIS, it is the perfect solution for efficiently programming and optimising parts.

## Industry 4.0

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



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 12 Tornos Service 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 more than 125 years legacy of expertise and in-depth understanding of customers' processes, applications and challenges across a wide range of industrial segments, including Automotive, Micromechanics, Electronics, and Medical & Dental.

### 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 your Tornos machine, we stock the essential certified spare parts to keep the machine running at peak performance.

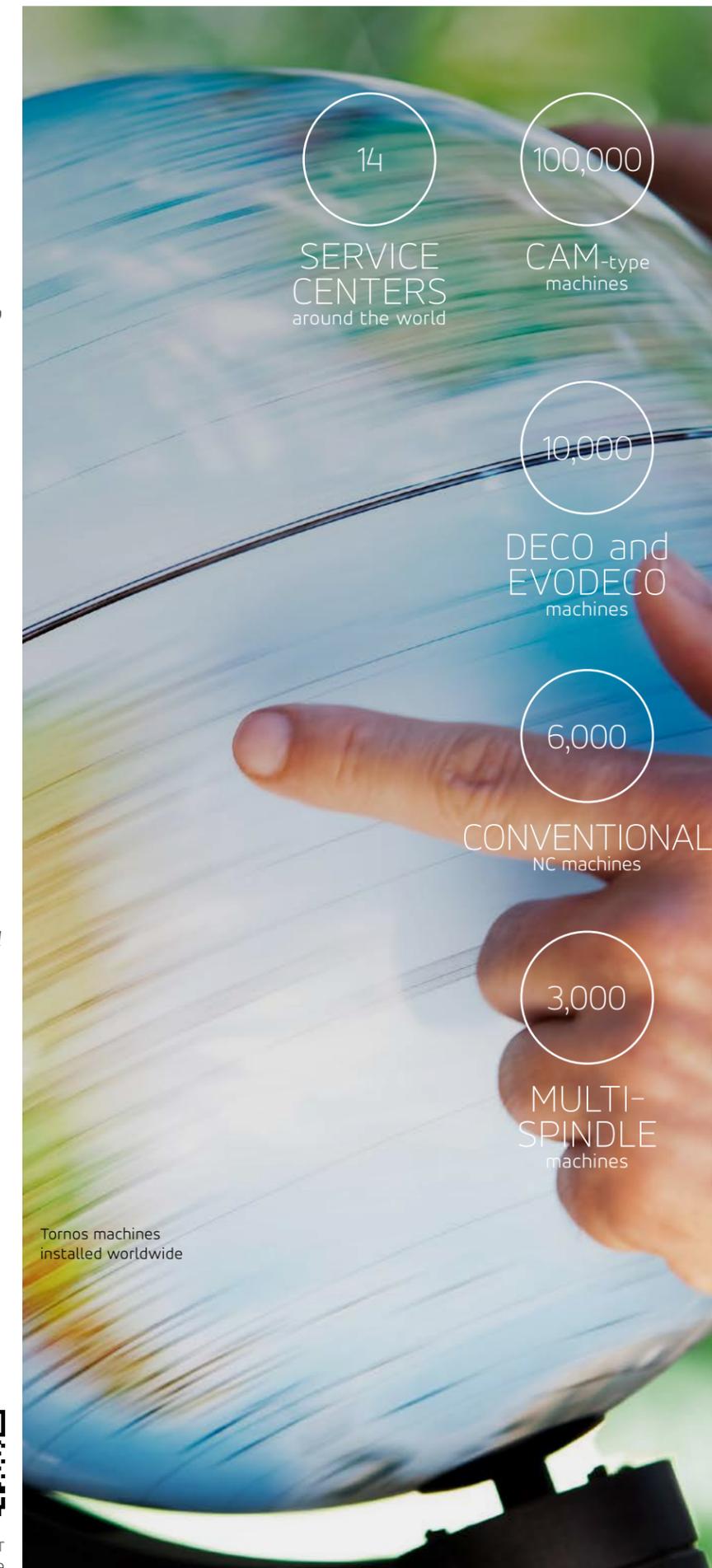
### Machine overhauls

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.

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.



Discover Tornos Service

# Technical specifications



TECHNICAL SPECIFICATIONS	SwissDECO 26	SwissDECO 36
	9 linear axes	9 linear axes
	+ 2 C axes	+ 2 C axes
	3 independent tool systems	3 independent tool systems

## Main spindle (Z1/S1/C1)

Max. bar capacity (without)	mm	23 (25.4)	32 (36)
Max. bar capacity with guide bush	mm	25.4	32
Standard workpiece length without guide bush (maxi 3xD)	mm	48 (75)	38 (100)
Standard workpiece length with rotating guide bush (frontal ejection) Long part option: 600 mm	mm	300 (200)	300 (200)
Total number of tools	Nbr/max.	57	57
Spindle rotation speed	rpm	10,000	8000
Spindle output	kW	12	10
Max. torque	Nm	27	53
Drilling capacity (9SMnPb36)	mm	Ø 14	Ø 16
Tapping capacity		M12	M12

## Plattens (X11/Y11/S12) (X21/Y21/Z21/S21)

Number of tool positions on guide bush (turning tool section 16x16)	Nbr/max.	18	18
Positions for rotating tools	Nbr/max.	15	15
Deep drilling capacity	mm	200	200
Rotating tool speed of rotation (Ratio 1:1)	rpm	6000	6000
Nominal power of rotating tools (S6)	kW	2.4 (15 Nm)	2.4 (15 Nm)
Drilling capacity (9SMnPb36) of rotating tools	mm	Ø 12	Ø 12
Tapping capacity (9SMnPb36) of rotating tools	mm	M12x5 mm/ M10x10 mm	M12x5 mm/ M10x10 mm

## A axis on dual platten version (main and secondary operation machining)

Positions for rotating tools on A axis	Nbr/max.	7	7
Number of fixed tools	Nbr/max.	2	2
Drilling capacity (9SMnPb36) of rotating tools	mm	Ø 5	Ø 5
Nominal torque of rotating tools	Nm	1.2	1.2
Rotating tool speed of rotation	rpm	6000	6000

TECHNICAL SPECIFICATIONS	SwissDECO 26	SwissDECO 36
--------------------------	--------------	--------------

## Turret version (X21/Y21/Z21/S21)

Number of tool positions		12	12
Positions for rotating tools		12	12
Max. number of tools		36	36
Max. coolant pressure through the turret	bar	50 (120)	50 (120)
Tool holder system	Type	BMT45	BMT45
Max speed of rotating tools	rpm	6000	6000
Max. drilling capacity	mm	Ø 10	Ø 10
Thread capacity of rotating tools	mm	M8 x 1.25	M8 x 1.25
30°/180° indexing time	s	0.2 s	0.2 s

## B axis on turret version

Optional Optional

## Secondary operations (S41)

Number of tool positions		16	16
Number of rotating (fixed) tools (rotating tool section 16x16)		4	4
Positions for rotating tools (transversal, L maxi 55 mm)		4	4
Positions for rotating tools (frontal) (L maxi 55 mm)		8	8
Number of fixed frontal tools		4	4
Rotating tool power (S6)	kW	1.3 (8.2 Nm)	1.3 (8.2 Nm)
Rotating tool speed of rotation	rpm	10,000	10,000
Drilling capacity (9SMnPb36) of rotating tools	mm	Ø 8	Ø 8
Tapping capacity (9SMnPb36) of rotating tools	mm	M8x10	M8x10

## Counter spindle (X4/Y4/Z4/S4/C4)

Max. bar capacity	mm	25.4	36
Maximum part length out of collet	mm	50	100
Part length inserted inside spindle with ejector (without ejector)	mm	200 (500)	220 (600)
Spindle rotation speed	rpm	10,000	8000
Spindle output	kW	12	10
Max. torque	Nm	27	53

## Axis feed rate

Rapid feed rate	m/min	35	35
-----------------	-------	----	----

BASIC MACHINE EQUIPMENT

SwissDECO 26

SwissDECO 36

Rotating guide bush with integrated motor	○	○
Machining without guide bush	●	●
S21 rear platten rotating tool motor	●	●
S11 front platten rotating tool motor	○	○
S51 rotating tool motor in counter-operation	●	●
C1 + C4 axes	●	●
Interpolation in polar coordinates	●	●
Pneumatic workpiece ejector + oil cleaning of collet	●	●
Automatic centralized lubrication cycle	●	●
Stack light (4 colours)	●	●
10-bar coolant pump	●	●
Bar feeder interface	●	●
Fire extinguisher interface	●	●
TISIS programming software	○	○
A axis on rear platten	○	○
B axis on turret	○	○
Machining with 5 simultaneous axes	○	○

**Numerical control**

CNC type	FANUC 31i-B5	FANUC 31i-B5
Axis motor/encoder technology	Absolute serial	Absolute serial
Motor type (axes and guide bush)	Synchronous (AC)	Synchronous (AC)
Motor type (spindles)	Asynchronous (AC)	Asynchronous (AC)
Colour screen and mobile operator console	Touchscreen 21.5"	Touchscreen 21.5"

**Programming software**

ISO language code C, TMI, TISIS

**General specifications**

Max. width	mm	1600	1600
Max. length	mm	3000	3000
Height	mm	2000	2000
Spindle height	mm	1190	1190
Weight	kg	5900	5900
Colours RAL 9006 grey, RAL 9011 black			
CE/EMC certified			

**Peripherals and options**

Cutting oil tray capacity	litres	400	400
Coolant pump flow / 10 bar	l/min	100	100
Type of coolant		Water based coolant/oil	Water based coolant/oil

● Standard   ○ Optional   — Not available

We keep you turning



[tornos.com](http://tornos.com)

TORNOS SA

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

Tornos  
throughout  
the world



**Complies with current European CE/EMC Safety Directives.**  
This document is based on information available at the time of publication. While every effort has been made to be accurate, the information contained herein does not purport to cover all details or variations in hardware and software, nor to provide for every possible contingency in connection with installation, operation and maintenance. TORNOS SA assumes no obligation of notice to holders of this document with respect to changes subsequently made. TORNOS SA makes no representation or warranty, expressed, implied, or statutory with respect to, and assumes no responsibility for the accuracy, completeness, sufficiency or usefulness of the information contained herein. No warranties of merchantability nor fitness for purpose shall apply.