



THINK PARTS THINK TORNOS



MICRO 8

High precision sliding headstock
type CNC automatic lathe

TORNOS IS A SOLUTION PROVIDER FOR THE HIGH TECH INDUSTRIES INCLUDING

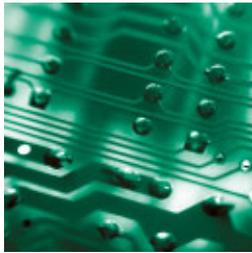
Automotive



Medical



Electronics



Watch making



MICRO 8

THE SOLUTION FOR VERY HIGH PRECISION MACHINING OF SMALL-DIAMETER PARTS



Advantages of the Micro 8

High accuracy

- $\pm 1 \mu$! The most precise parts on the market are within your reach!

Rigidity

- You can tackle all kinds of material.

Speed

- Responsive 15'000 rpm spindle.

Power

- The horsepower for today's tooling and materials.

**Flexibility**

- Multiple configurations available for different applications.

Compact

- Small foot print.

User friendly

- Optimized design for set-up, production and maintenance.

Good reasons to choose the most cost effective solution on the market!

MICRO 8



Micro 8

1. Fanuc numerical control
2. Main and counter-spindle with integrated Fanuc motor
3. Visibility and access to the working area

A MACHINE DESIGNED TO MEET TODAY'S REQUIREMENTS AND TOMORROW'S MANUFACTURING CHALLENGES



- 4. Counter-spindle for simultaneous machining
- 5. 20 tools for flexibility
- 6. Chip tray with access hatch
- 7. Removable oil tank with level indicator
- 8. Rigid machine frame
- 9. Thermally stable structure
- 10. Centralized lubrication system
- 11. Integrated electrical cabinet

MICRO 8
AS A PRECISION TURNED PART MANUFACTURER
YOU CAN BENEFIT FROM OUR EXPERIENCE



SUS 303
Ø 3 mm



Free cutting steel
Ø 1.2 mm



Stainless steel
Ø 6 mm



Stainless steel
Ø 7.6 mm



Stainless steel
Ø 7 mm



Stainless steel
Ø 5 mm



Stainless steel
Ø 7 mm



Brass
Ø 1 mm



Titanium
Ø 8 mm



Mild steel
Ø 5 mm



Brass
Ø 6 mm



Mild steel
Ø 9 mm



Stainless steel
Ø 5 mm



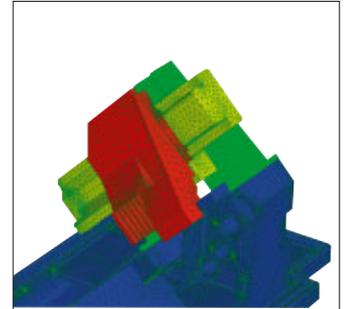
Stainless steel
Ø 5 mm

MICRO 8

BENEFITS TO YOU: HIGH PRECISION AND MACHINING STABILITY

Rigidity is the backbone of accuracy

- Rigidly built castings developed using 3D CAD and Finite Element Analysis (FEA).
- One piece casting for machine base and bed.
- Highly rigid tool frame mounted directly to the machine bed giving full support to the massive 12 x 12 mm turning tools.
- Spindle motor and axis drives are engineered to provide the power necessary to fully utilize rigid and modern cutting tools.
- The spindles and tools move along very rigid guide rails, thereby guaranteeing excellent machining stability.



HIGH PRECISION TURNING

Reworking operations are dispensed with

- Dimensional tolerances: 0.002 mm – form tolerances (circularity): 0.001 mm

Rough machining

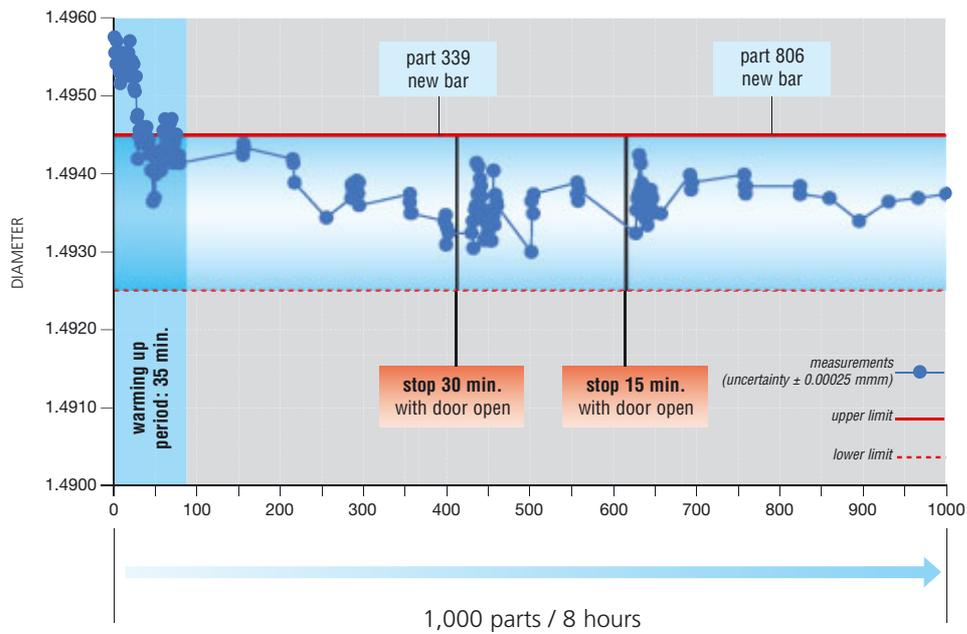
Internal finishing turning

Rectification of the external diameter

One single process with the Micro 8



MEASUREMENTS DURING 8 HOURS PRODUCTION



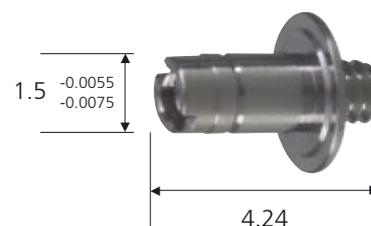
Test Conditions

Ambient temperature	21-25°C
Material	SUS 303 cu
Oil	Mineral oil
Measured diameter	1.5 mm
Cycle time	34 sec.
Spindle speed	8,000 rpm
Feed rate	0,01 mm/rev.
Depth of cut	0,2 mm
Number of parts produced	1,000

Results

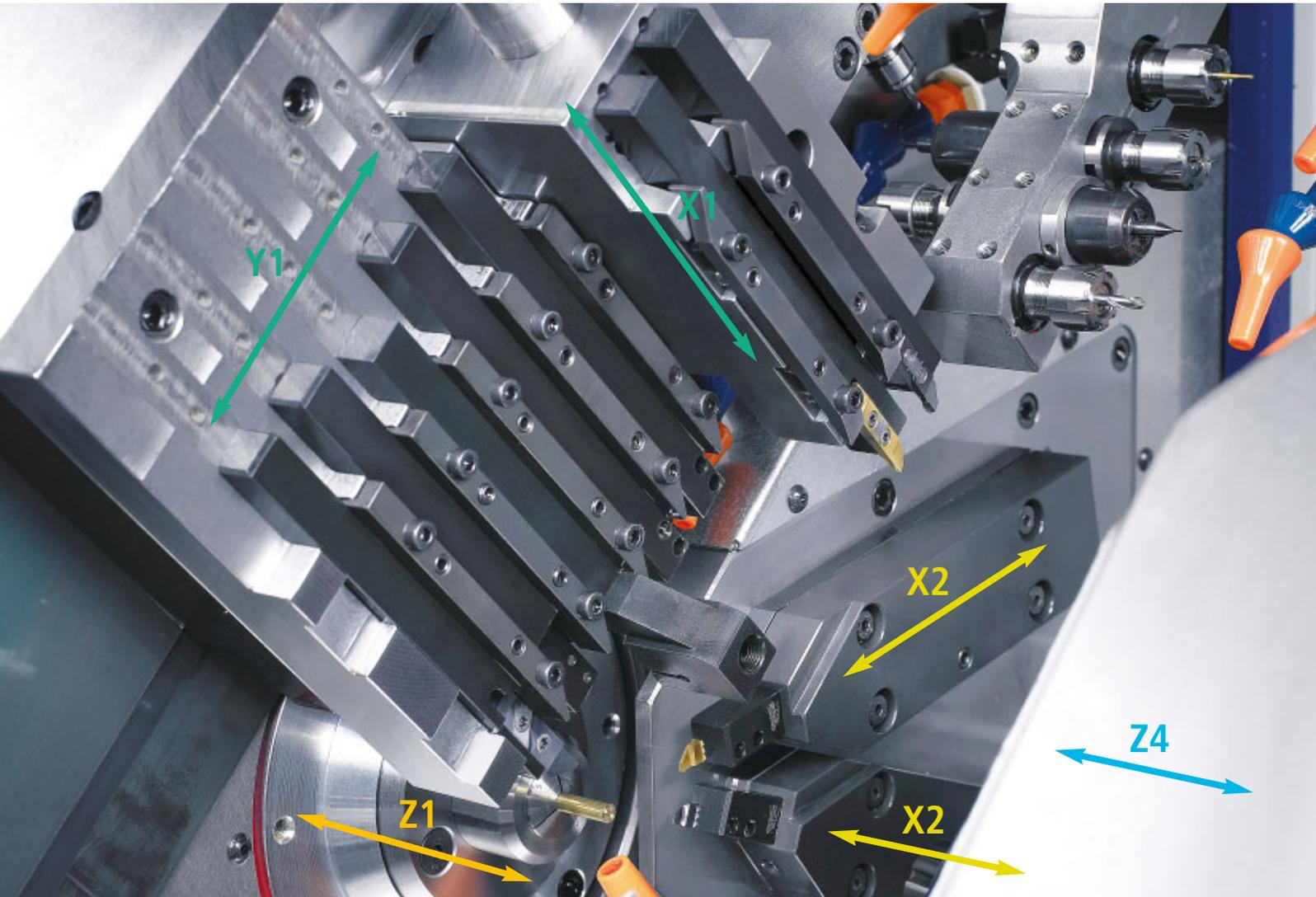
Result: Following 1.4 µ heating dispersion.
Including stops and bar changes

- Gets up to temperature quickly
- Further machining stability
- High precision



MICRO 8

YOUR ADVANTAGES: SPEED – POWER – EFFICIENCY



Flexible tool arrangement for producing a large variety of components in all materials – even the toughest ones.

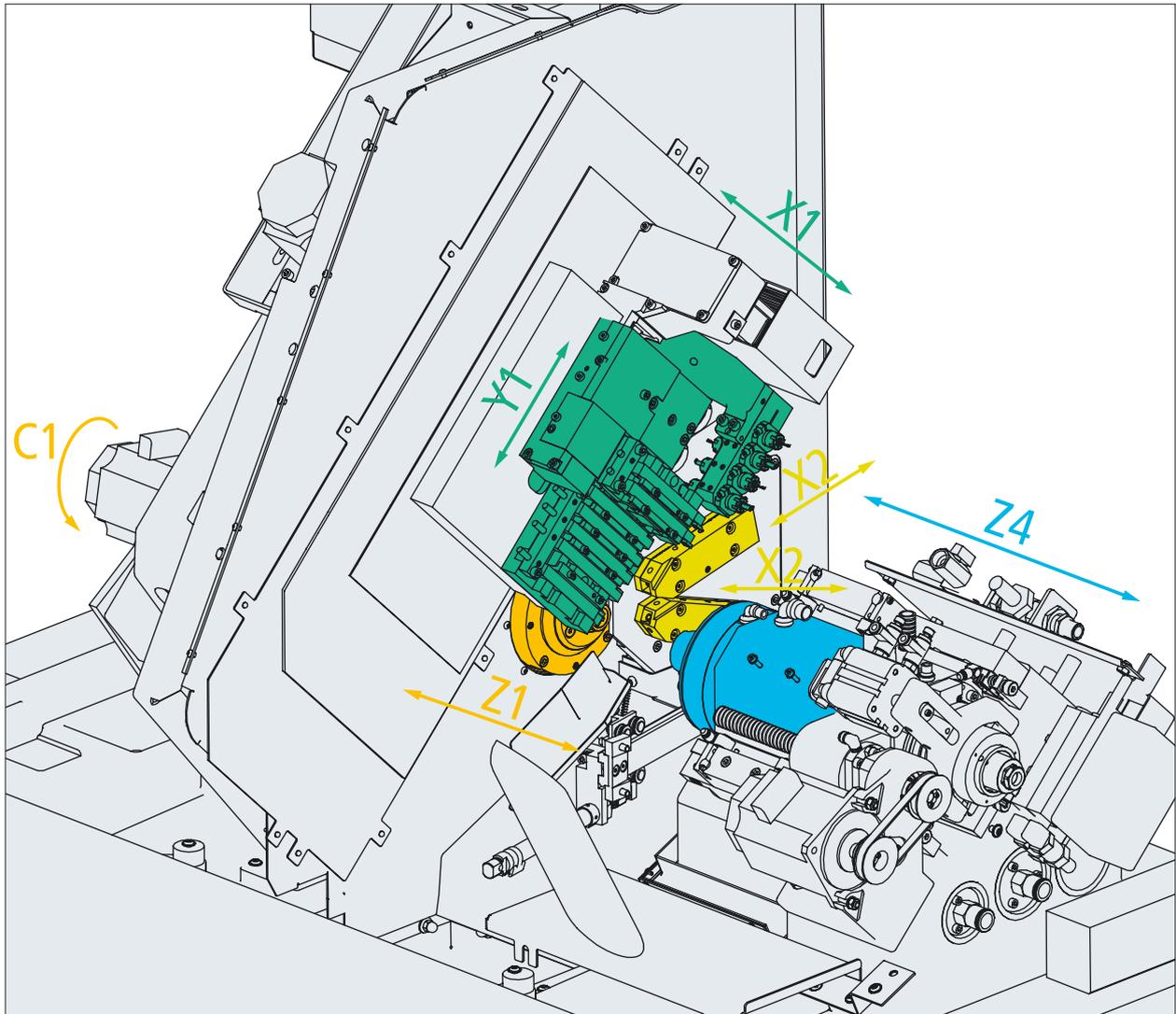
- Speed 15000 rpm.
- Power 2.2 Kw/3.7 Kw.
- Powerful high speed headstock and counter spindle to tackle all materials and make your cutting cycle the shortest possible.

- System of linear tools mounted on a main 2-axis cross slide.
- 2nd tool system for external and internal turning, finishing and precision.
- 20 tools.

Number of axes

- 5 axes as standard + 2 C-axes as an option.

A PRODUCTIVE MACHINE WITH 5 INDEPENDENT AXES TO SUPPORT COMPLEX MACHINING PROCESSES



Linear tool system

Mounted on 2 axis, X1 and Y1 cross-slide, where the following can be adapted:

- 5 or 8 driven transverse turning tools or of the HF motorized spindle type for drilling, milling, slitting etc.
- 2 axial turning tools for operation and counter-operation mode (1+1).
- 2 additional turning tools for external counter-operation turning.

- 4-position support, boring 16mm diameter, able to accommodate up to 4 end-fixed tools in operation mode and 4 in counter-operation mode for tapping, stamping and external and internal turning.

Radial tool post

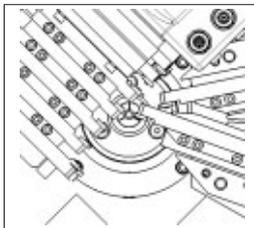
- 2 radial precision turning tools driven by an independent numerical axis.

MICRO 8

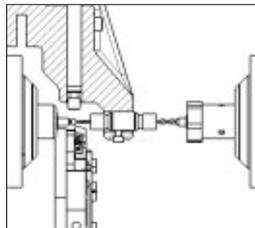
YOUR ADVANTAGE: A FLEXIBLE TOOLING SYSTEM!

A tool layout enabling simultaneous machining on the headstock and counter-spindle increasing productivity.

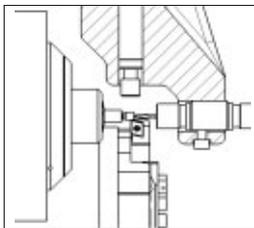
Combination of machining process



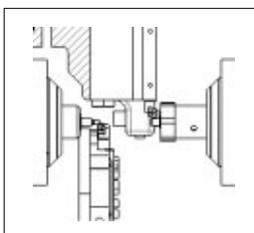
Simultaneous turning – rough and finishing



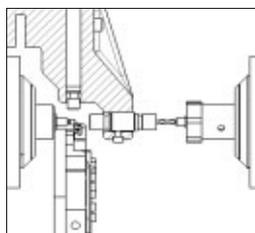
Front/Back simultaneous drilling



Turning + Front drilling

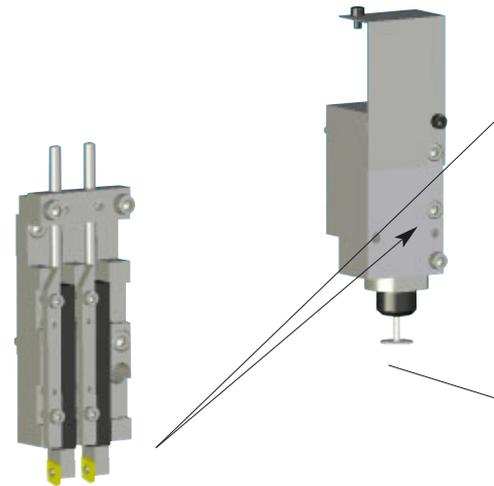


Front/Back simultaneous turning

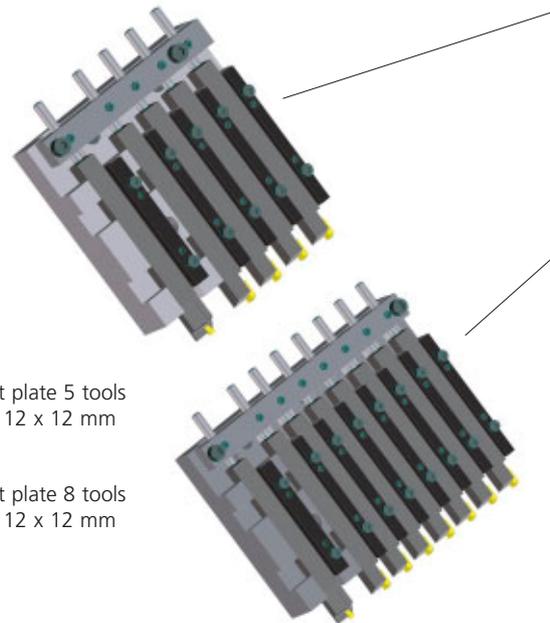


Turning + drilling – front and back

2410
Simple support, Ø 25 mm
+ Rotating spindle with drive S11 (2510)

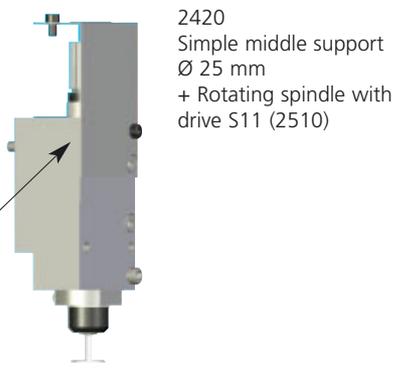


2430
Support for 2 tools
12 x 12 mm

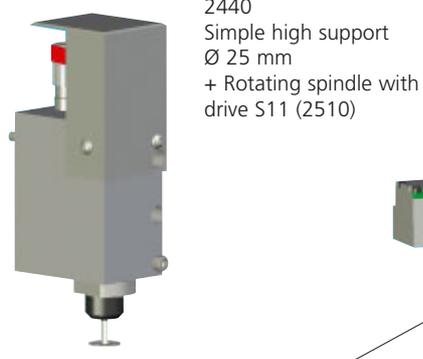


2110
Support plate 5 tools
section 12 x 12 mm

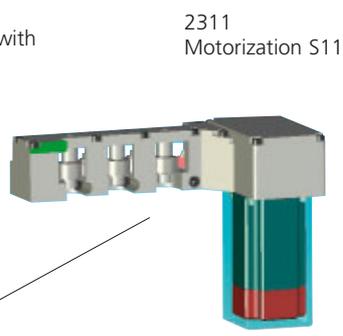
2120
Support plate 8 tools
section 12 x 12 mm



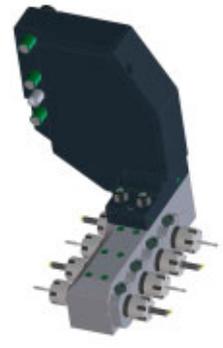
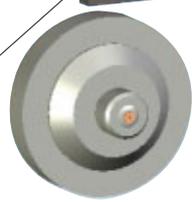
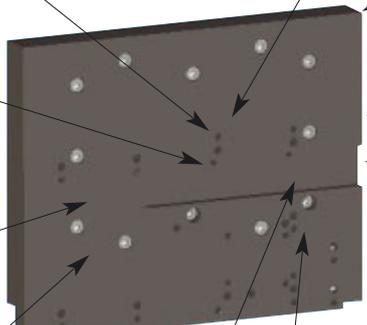
2420
Simple middle support
Ø 25 mm
+ Rotating spindle with
drive S11 (2510)



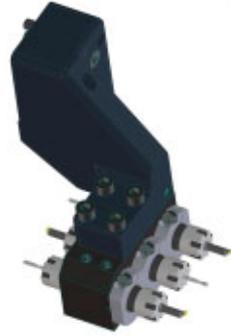
2440
Simple high support
Ø 25 mm
+ Rotating spindle with
drive S11 (2510)



2311
Motorization S11



2210
Support with 4 bores
Ø 16 mm



2220
Support with 3 bores
Ø 16 mm



2250
Unit for end working
rotating tools



2450
Double low support
with 2, Ø 25 mm
+ Rotating spindle
with drive S11
(2510)

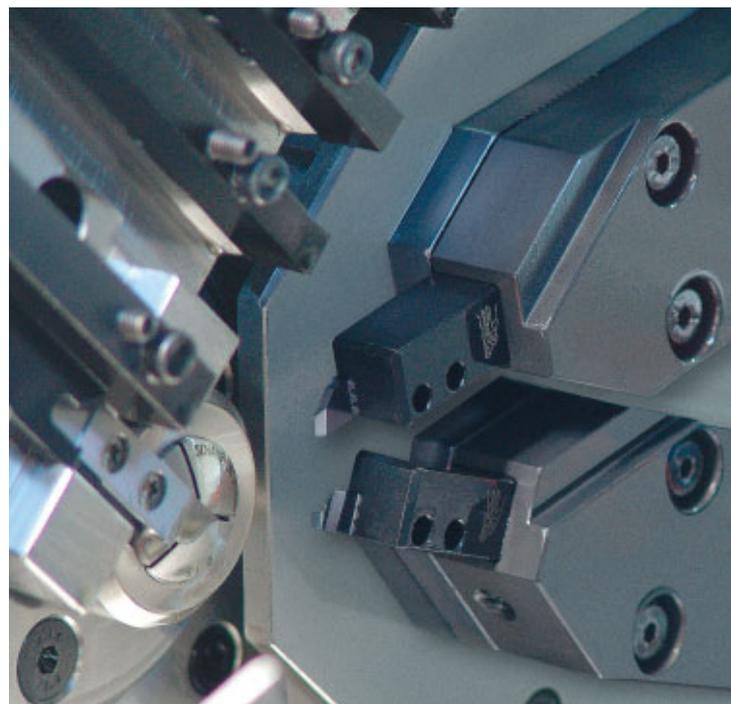
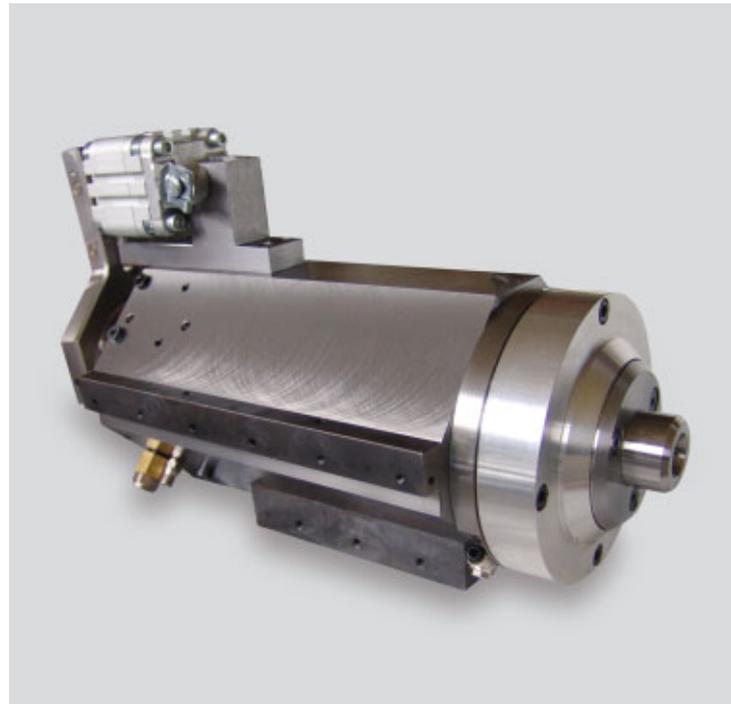


2460
Simple low support type 2
Ø 25 mm
+ Rotating spindle with
drive S11 (2510)

MICRO 8

A SINGLE SPINDLE SLIDING HEADSTOCK MACHINE WITH NO GUIDE BUSHING ENGINEERED TO ASSURE HIGH PRECISION MACHINING

- Spindle technology
 - Thermally regulated integral motor spindles.
 - Front bearing located close to the cutting point for high rigidity.
 - Front ceramic ball bearings to improve stability and precision.
 - Draw-type collet for main spindle. The collet is located directly in the main spindle nose, without using a collet or collet sleeve, hence resulting in a higher degree of accuracy and precision.
- Innovative design of both main spindle and counter spindle guide ways to avoid thermal displacement of the spindles.
- Thermal stabilization of the machine: permanent circulation of the cutting liquid throughout the machine during production and setting work so as to maintain the entire machine at a constant temperature.
- 2 radial precision turning tools controlled by a single numerical axis to assure the best machining finishes.



MICRO 8

YOUR ADVANTAGES : COMPACT AND USER FRIENDLY



- Excellent ergonomics.
 - Fully enclosed guarding covering the work zone.
 - Slant bed configuration and vertical tool layout giving good access to the work zone and ensuring that chips created in the cutting process are not retained and fall free.
 - Pneumatic part separator with channel for the evacuation of the work piece.
 - Removable coolant tank and chip tray.

 - Central lubrication system.
 - Easy accessibility to maintenance areas: electrical cabinet, pneumatic unit, temperature stabilizer, etc.

 - Standard ISO programming or programming using TB-DECO software.
- Latest generation of NC Fanuc series 32i A 2 channels, 5 numerical axes and 2 spindles.
 - Interface Ethernet and/or Flash Memory card for quick data transfer.
 - Substantial NC and software functions included as standard:
 - tool nose radius compensation
 - background loading and editing of the part program
 - run hour + parts count display
 - rigid tapping function.
 - Software function developed by TORNOS:
 - standard basic cycles: initialization, new part and new bar
 - cycle for tool setting
 - standard multiple threading
 - Electronic crank lever.
 - More optional NC and software functions Inch/Metric, extra storage sizes, chamfering corner/radius, tool life management.

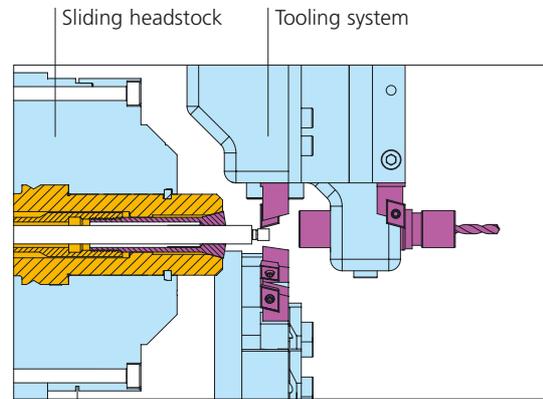
Micro 8: the best way of producing your precision parts!

MICRO 8

YOUR ADVANTAGES: COST EFFECTIVE MACHINE

Total cost saving

- Small footprint to maximize your production area.
- Guide-bush less machining and draw-type collet fully utilizing each bar (minimum remnant).
- Use of cold drawn bars no longer necessary thereby reducing production costs.
- Very high precision machining capacity thereby dispensing with reworking such as high-finish turning and grinding.

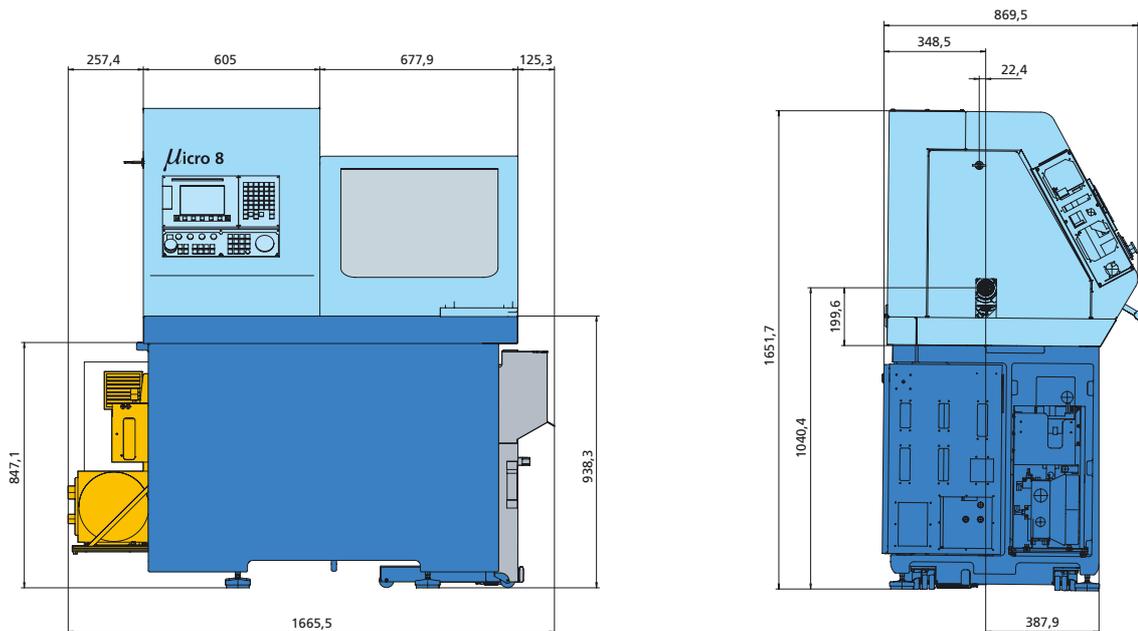


- High standard machine specifications.
- High productivity through fast cycle times and quick change overs.
- Durable configuration employing latest generation of Fanuc control and drive system.
- Integrated motor spindle and high frequency drilling units for simplicity.
- Easy maintenance.
- Standard interface to fit any kind of automatic bar feed system for long uninterrupted production runs with no operator intervention.
- One stop supplier for machine and bar feeder.
- Machine-tested in the TORNOS plants in Switzerland before delivery. The test includes all functions and an inspection of machine geometry. Production of test part ensures rapid start-up times and prolongs machine life.
- Choice between ISO programming and TB-DECO.
- Easy to use meaning very short learning curve.
- One stop supplier for machine and bar loader (available in 4 versions –2.5m, 3m, 4m and 12ft).
- No larger than a cam auto.

A Swiss high tech machine you can afford to purchase today to answer your challenges for many years to come!

MICRO 8

MACHINE SPECIFICATIONS



TYPE

Sliding headstock CNC lathe working without guide-bush

MACHINING RANGE

Headstock spindle	Passage of a round bar, max	10 (8 mm excluding preparation)
	Clamping collet type	W15-80-0003
Counter spindle	Passage of a round bar, max	mm 10
	Clamping collet type	F13-76-00357

MACHINING PERFORMANCE MATERIAL DIN C45

Headstock spindle	Max. drilling dia.	mm	6
	Max. tapping dia.	mm	M6
Counter spindle	Max. drilling dia.	mm	6
	Max. tapping dia.	mm	M6
Rotary tools (HF unit)	Max. drilling dia.	mm	3

MACHINE CAPABILITY

Speed range of main spindle			0-15,000
Speed range of counter-spindle			0-15,000
Total number of tools			20
External turning tool section			12 x 12
Number of external turning tools		max	10
Number of internal front drilling/turning tools		max	4
Number of internal rear drilling/turning tools		max	4
Number of transverse turning tools		max	3
Speed of driven transverse turning tools S11			10,000
Rotary tools speed (HF unit)		rpm	5000-80000
Number of controlled axes	Z1 / X1 / Y1 / X2 / Z4 (C1 / C4)		5 (7)
Number of axes working simultaneously			4
Rapid feed rate	X / Z	m/min	20
Rapid feed rate	Y	m/min	40

MOTORS

Main spindle	Power	kW	2,2 / 3,7
Counter spindle	Power	kW	2,2 / 3,7
S11 turning tools		KW	0.4
Coolant pump	Flow rate	L/min	120

OTHERS

Input power capacity		kVA	8
Ambiant working temperature		deg	max. 35 deg. C
Dimensions (L x P x H)		mm	1670 x 870 x 1650
Weight		kg	approx. 1600

MICRO 8

MACHINE SPECIFICATIONS

STANDARD ACCESSORIES

Pneumatic unit	bar	6
Pneumatic part separator with product receiver box		
Thermally regulated spindles		
Thermal stabilization of machine		
Central lubrication system		
Removable chip pan		
Removable oil tank with coolant level detector		
Coolant pump		
Warning lamp 1 color		
Work light		
Electrical interface for barloader		
Electrical interface for fire fighting system		

OPTIONAL ACCESSORIES

Oilmist extraction device DONALDSON		
Support plate 5 tools section 12 x 12 mm		
Support plate 8 tools section 12 x 12 mm		
Support with 4 bores Ø 16 mm		
Support with 3 bores Ø 16 mm		
Double ended extension Ø 16 mm ER11		
Combination dble ended ext.Ø 16 mm ER11		
Unit for end working rotating tools		
Motorization S11		
Simple support Ø 25 mm		
Simple middle support Ø 25 mm		
Support for 2 tools 12 x 12 mm		
Simple high support Ø 25 mm		
Double low support with 2 Ø 25 mm		
Simple low support type 2 Ø 25 mm		
Rotating spindle with drive S11		
Rotating HF		
Adaptation for F10 collet		
Adaptation for F8 collet		
Inklusive Filter (Ab Werk)		
Part conveyor belt		
Vacuum-operated recovery system of small parts		
Programmable light tower, 3 colors		
Sensor for the checking of tool breakage		
TORNOS SBF 210 automatic bar feeder		
BARLOADER TRYTON 112 CNC		
Adapt. bar loader LNS TRYTON 112 CNC		
Adapt. barfeed tube HYDROBAR THB 16		

The list of the options and accessories above only represents some of the many adaptations already available for the Micro 8. If you would like further information, please do not hesitate to contact your Tornos dealer.

STANDARD NC/SOFTWARE FUNCTIONS

NC unit type FANUC series 32i
7,2" monochrome screen
Interface Ethernet, RS 232, flash memory card
ISO / TB-DECO programming
Part program storage size 64 kBytes
32 tool geometries and 32 tool offsets
Tool nose radius compensation
Background loading and editing of the part program
Run hour + part count display
Standard basic cycles: initialization, new part, new bar
Cycle to set the tools
Standard multiple threading cycle
Rigid tapping function
Positioned indexing S1, increment of 0,1 deg on headstock spindle
Counter-spindle stop
Electronic crank lever

CN FUNCTION AND SOFTWARE OPTIONAL

C1 axis function/0,001 degree increment
Positioned indexing S4/incr. 0,001°
C4 axis funct./0,001 degree increment
Part program storage size 128 Kb
Part program storage size 512 Kb
Part program storage size 2 Mb
64 tool geometries + 64 offsets
Inch/metric programming G70/G71
Chamfering corner/radius
Polar coordinates interpolation Transmit
Cylindrical interpolation
Constant surface speed function G96
Machining cycles: drilling/clean out
Macros B client
Tool life management
Tool life management with warning light
CNC interface through the RS 232

COMPLIES WITH CE AND CEM STANDARDS

*Note: The machining capacities apply S45 C (AISI 1045, DIN C45) material.
The machining capacities may differ from listed values depending on the machining condition,
such as the material to be machined or the tools to be used.*

**TORNOS S.A.**

Rue Industrielle 111
CH-2740 Moutier
Tel. +41 (0)32 494 44 44
Fax +41 (0)32 494 49 03
contact@tornos.com
www.tornos.com

**TORNOS TECHNOLOGIES
DEUTSCHLAND GmbH**

Karlsruher Str. 38
D-75179 Pforzheim
Tel. +49 (0)7231 / 910 70
Fax +49 (0)7231 / 910 750
contact@tornos.de

**TORNOS TECHNOLOGIES
FRANCE**

Boîte postale 330
St-Pierre en Faucigny
F-74807 La Roche
s / Foron Cedex
Tel. +33 (0)4 50 038 333
Fax +33 (0)4 50 038 907
contact@tornos.fr

**TORNOS TECHNOLOGIES
IBERICA**

Pol. Ind. El Congost
Avda. St Julia, 206 Nave 8
E-08403 Granollers
Tel. +34 93 846 59 43
Fax +34 93 849 66 00
comercial.tti@tornos.com

**TORNOS TECHNOLOGIES
ITALIA SRL**

Via Cesare Pavese 21
I-20090 Opera / MI
Tel. +39 02 57 68 15 01
Fax +39 02 57 68 15 230
contact@tornos.com

**TORNOS TECHNOLOGIES US
CORPORATION**

840 Parkview Boulevard
US - Lombard, IL 60148
Tel. +1 203 775 4319
Fax +1 203 775 4281
info-us@tornos.com

**TORNOS TECHNOLOGIES
UK LTD**

Tornos House
Whitwick Business Park
Coalville
UK-Leicestershire LE67 4JQ
Tel. +44 (0) 1530 513100
Fax +44 (0) 1530 814212
sales@tornos.co.uk

**TORNOS SHANGHAI
REPRESENTATIVE OFFICE**

Room 512-513, Tower B
Far East International Plaza
No. 317 Xianxia Road
Shanghai 200335, PRC
Tel. +86 (0)21 6235-1235
Fax +86 (0)21 6235-1938
china.contact@tornos.com

**TORNOS TECHNOLOGIES
ASIA LIMITED**

Unit 4, G/F, Transport City Building
1-7 Shing Wan road
Tai Wai, Shatin.N.T.
Hong Kong
Tel. +852 2691 2633
Fax +852 2691 2133
asiapacific.contact@tornos.com

Conforms to the European CE/CEM Safety Standards

This document is based on information available at the time of this publication. While efforts have 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 S.A. assumes no obligation of notice to holders of this document with respect to changes subsequently made. Tornos S.A. 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.