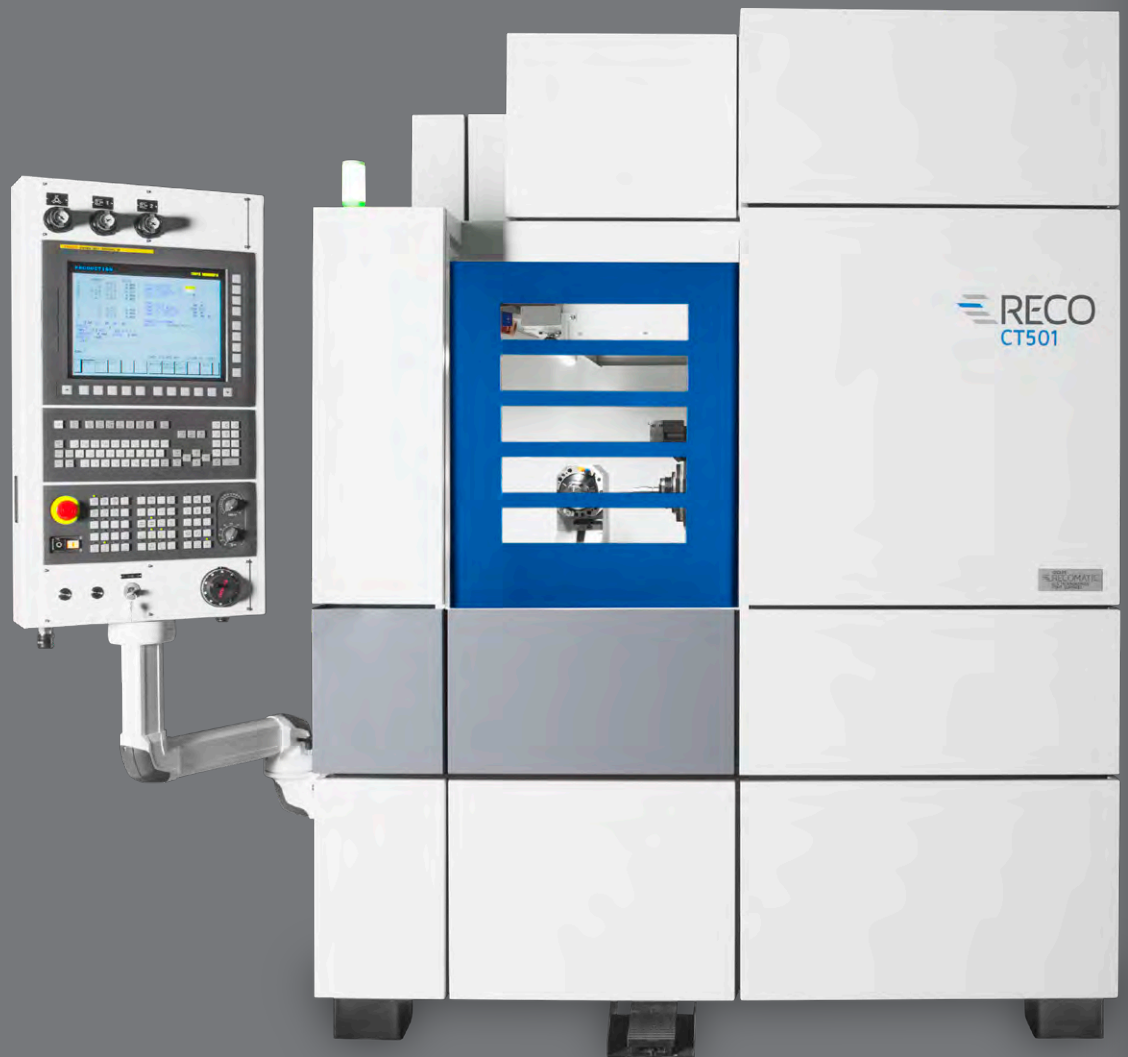


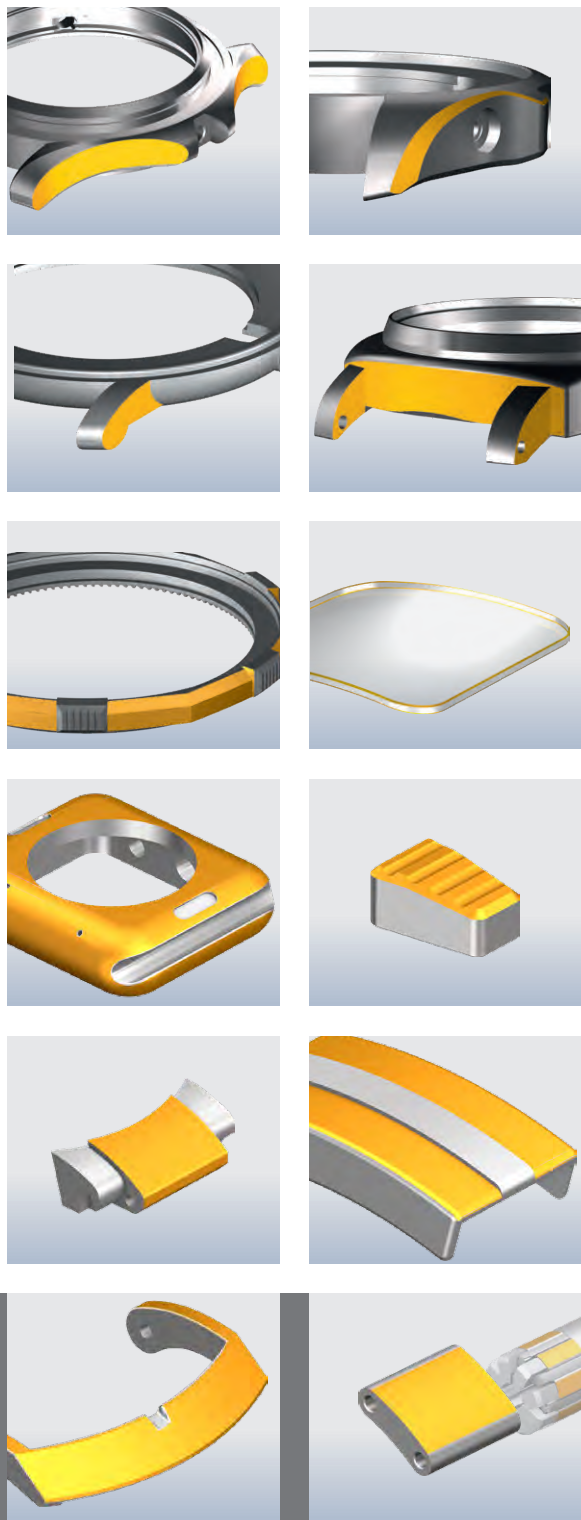
Compact CNC finishing center

- Single clamping for complete finishing
- Tool changer with 20 rotary tools
- 2 pivoting abrasive belts
- 6 numerical axes of which 5 are simultaneous
- Electro spindle 18,000 – 60,000 rpm
- Production concept 24 h/24 h



A proven concept

Meets requirements for today's complex shapes. Allows many machining possibilities with a single clamping for complete component finishing. Applicable to numerous industries and materials.



Industries:

- Watch
- Leather
- Jewelry
- Aeronautical
- Automobile
- Telephone
- Medical
- Etc ...



Machining zone

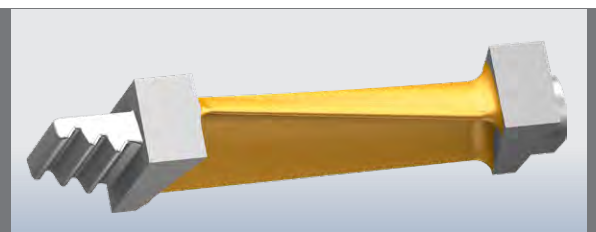
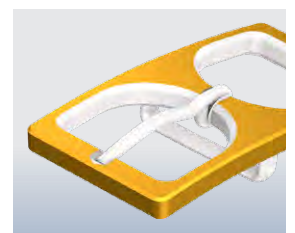
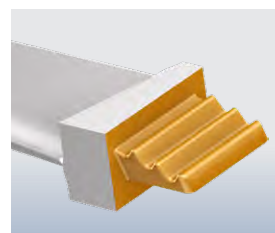
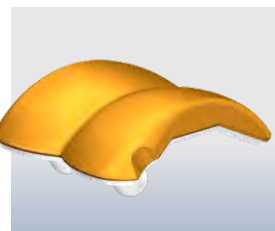
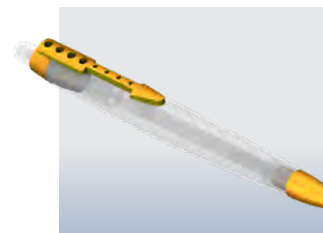
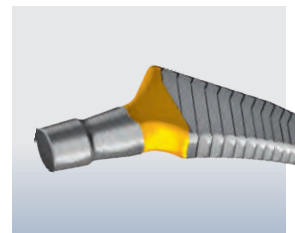
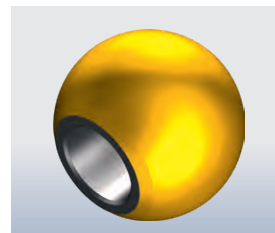
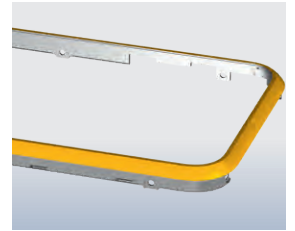
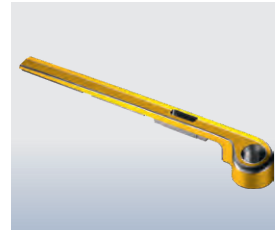
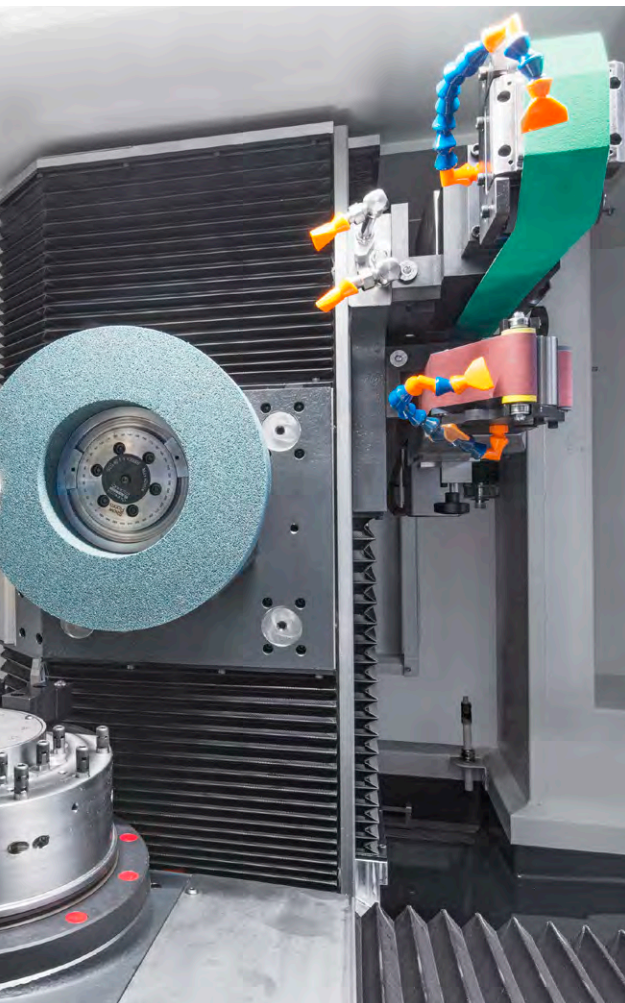
A combination of proven elements such as motor torque or two pivoting belt systems plus a compact kinematic gives this machine solid advantages in the precision and surface quality of the produced components.

Shapes

Grinding, pre-polishing, satin finishing and machining of multiple shapes is now possible.

Machinable materials:

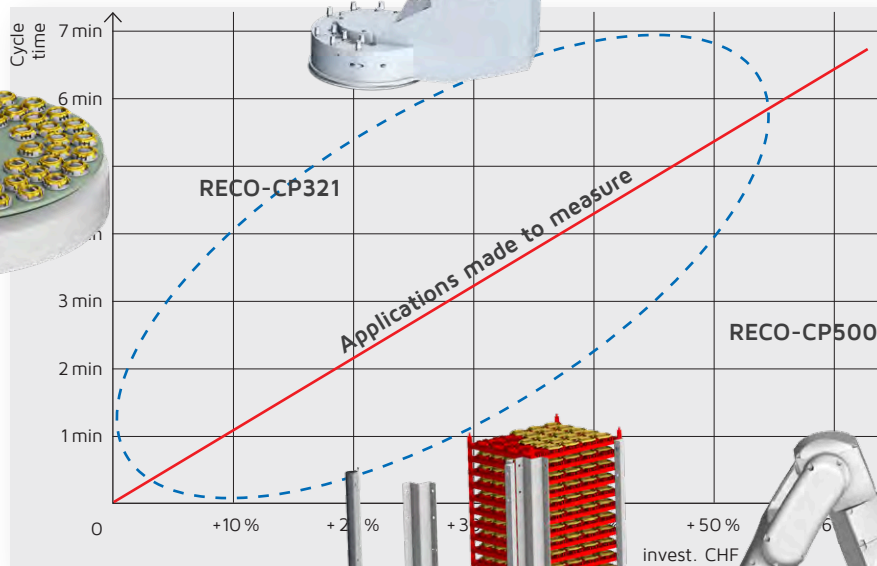
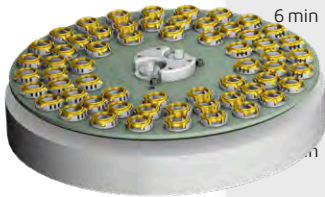
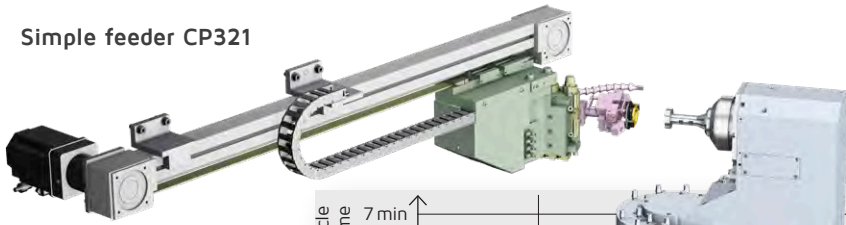
- Stainless steel
- Titanium
- Ceramic
- Sapphire
- Platinum
- Silver
- Gold
- Etc ...



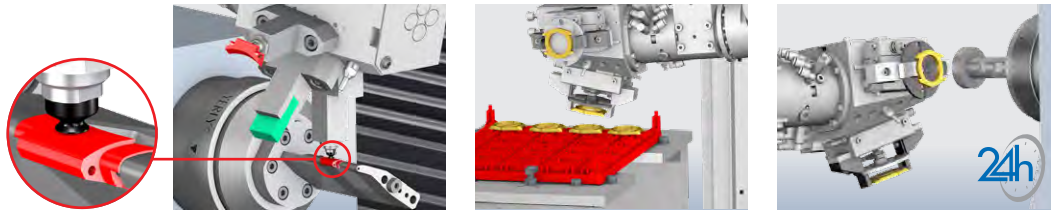
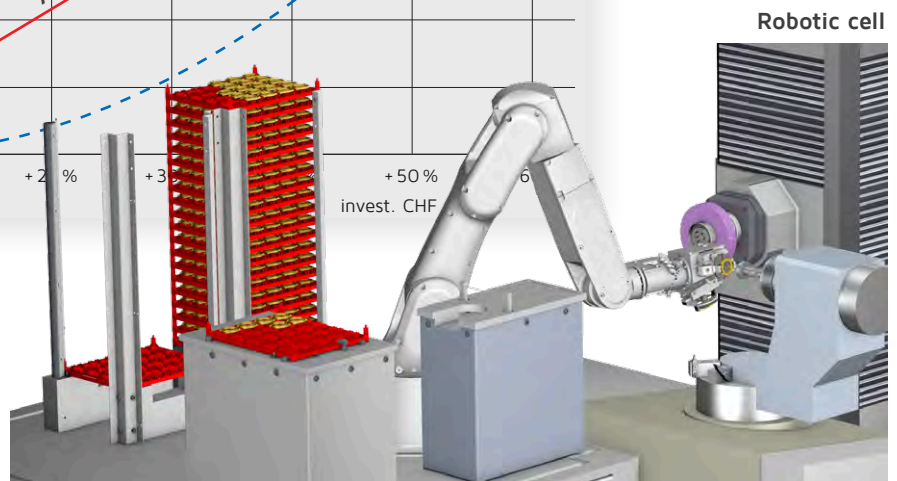
RECO-CT501 provides the necessary tools to produc



Simple feeder CP321



We provide you with different feeder systems according to your criteria: budget, complexity, cycle time, autonomy ...



DAY (8h / 220j) = 1,760 h

20%

NIGHT (16h / 220j) = 3,520 h

40%

Objective: 6,000 hours of annual production

One year count 8,760 hours

1,000

2,000

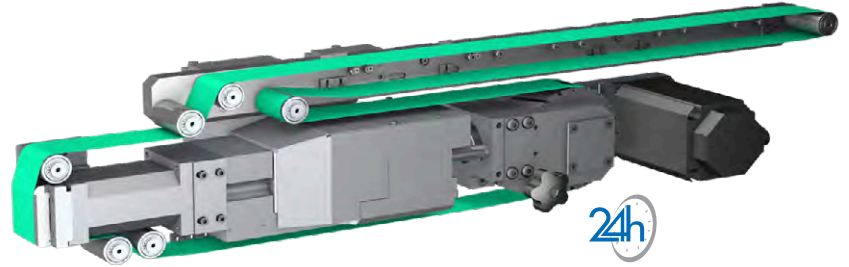
3,000

4,000

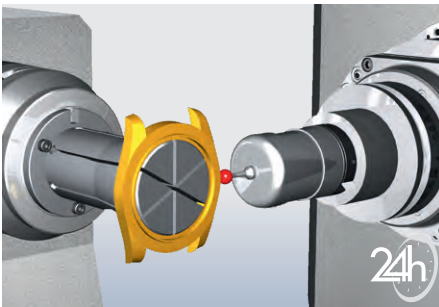
e 24 h/24 h



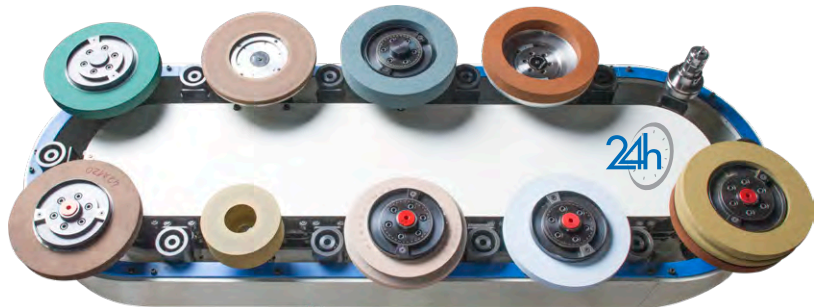
Automatic mill dressing with dimensional tool compensation.



Extension possibility up to 3 m for abrasive tools to double autonomy.



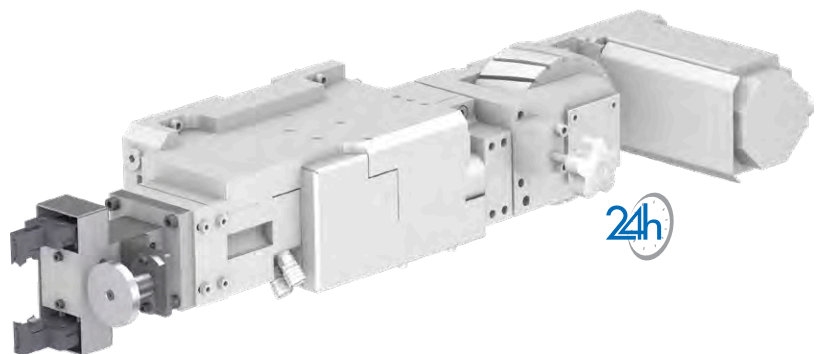
Measurement during process to guarantee dimensional quality without intervention.



Tool changer with up to 20-tool capacity. Twin tool management.



Access to production information from anywhere at anytime.



Complete machining of parts thanks to the reversing gripper.

WEEKEND 8%
= 720 h

68%

How many production hours do your machines attain annually ?

5,000

6,000

7,000

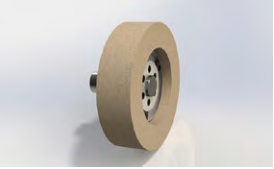
8,000

9,000

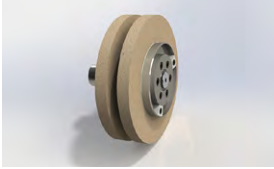
Production hours per year

Grinding

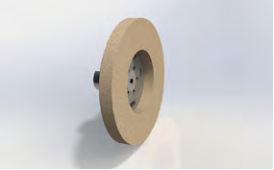
Screwed grinding wheel



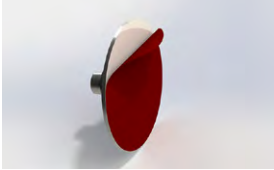
Double screwed grinding wheel



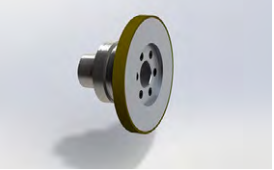
Glued grinding wheel



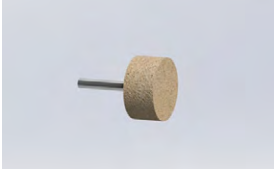
Abrasive paper disc



Diamond grinding wheel



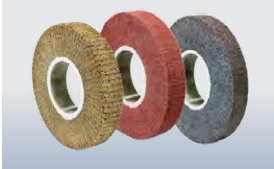
Grinding wheel on shaft



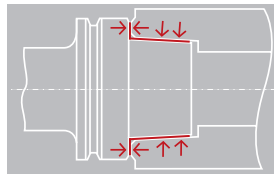
Wheel holder combined



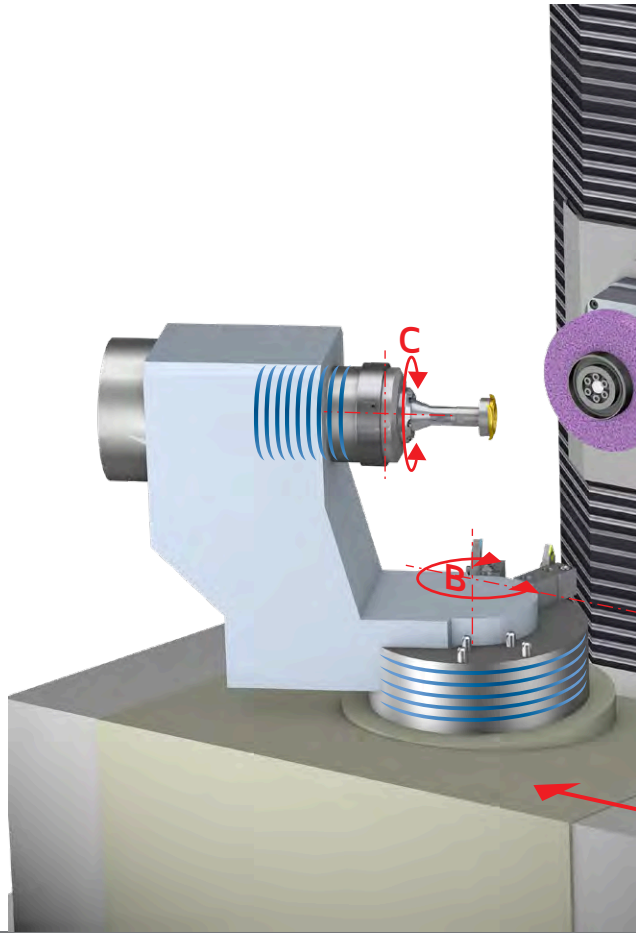
Brushes



"Swiss made" spindle
High precision and rigidity with HSK gripping



Thermal stability
Constant temperature water circulation for production stability.

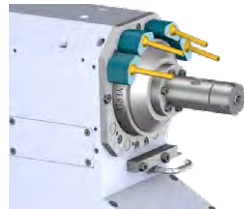
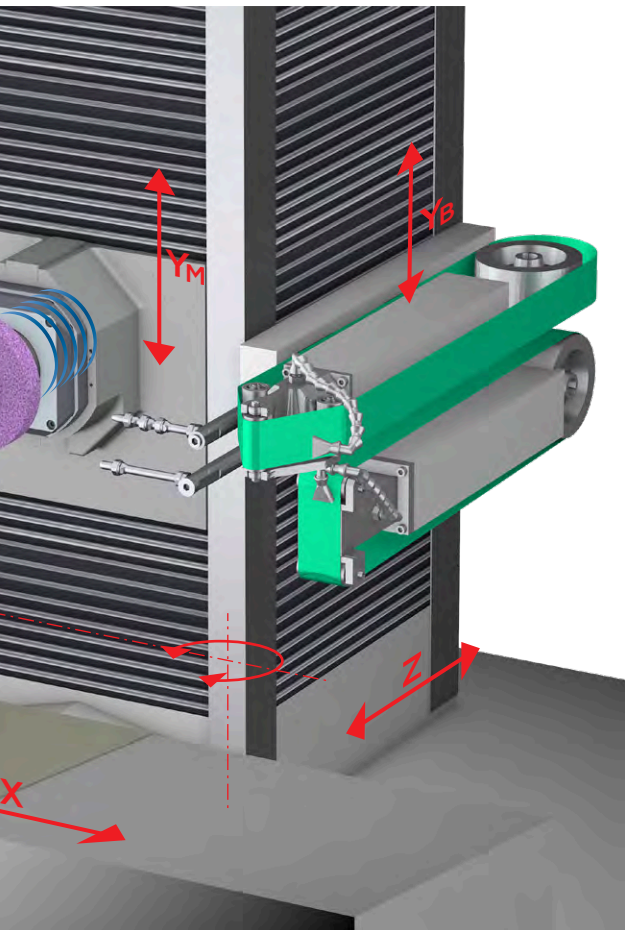


Dressing
Up to 6 pre-adjustable quick-change tools with built-in cooling for automatic wheel dressing.



Drilling, milling, engraving, measure

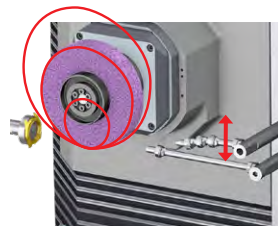
Warm up time reduced thanks to linear axis equipped with magnetic encoder.



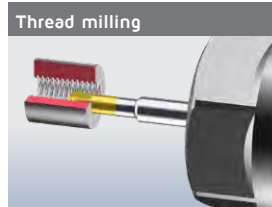
C axis head cooling



Cooling from above



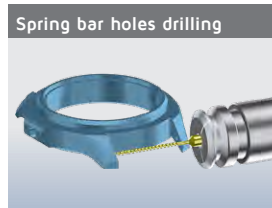
CNC axis cooling



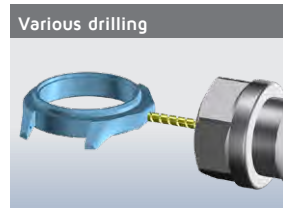
Thread milling



Engraving



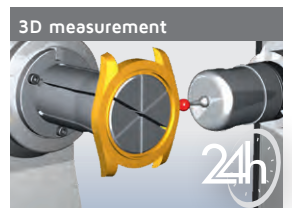
Spring bar holes drilling



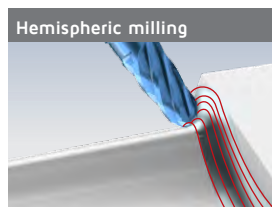
Various drilling



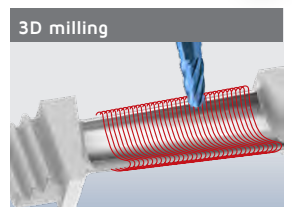
"Cotes de Genève" pattern



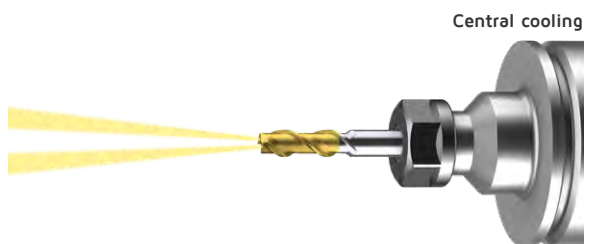
3D measurement



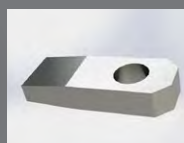
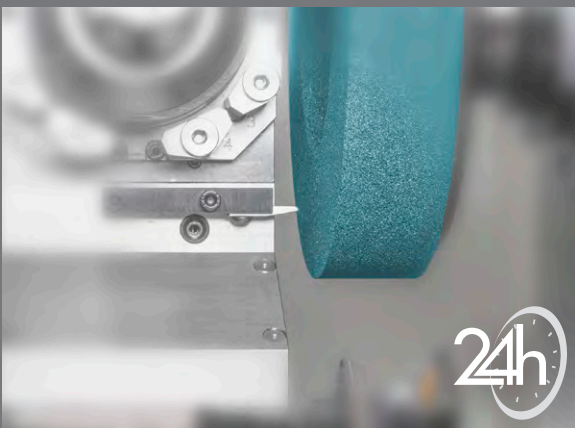
Hemispheric milling



3D milling

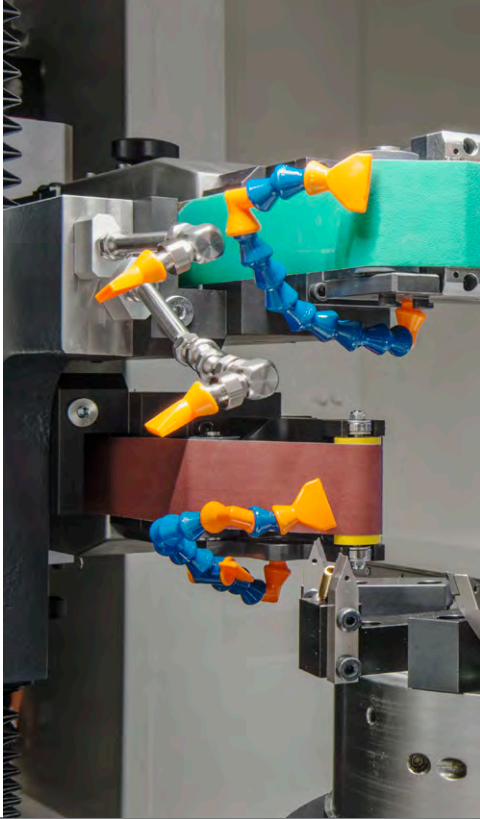
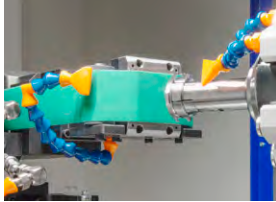
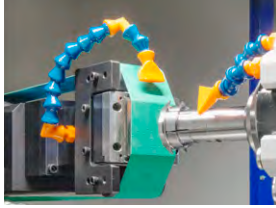
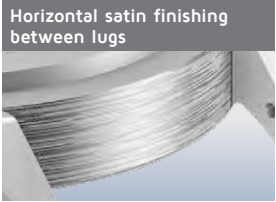
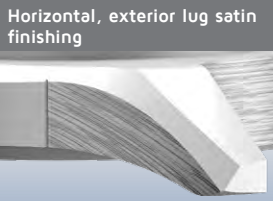
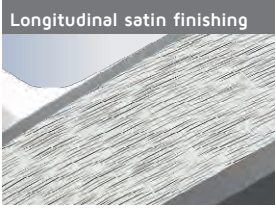
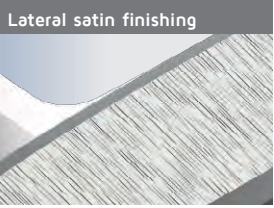
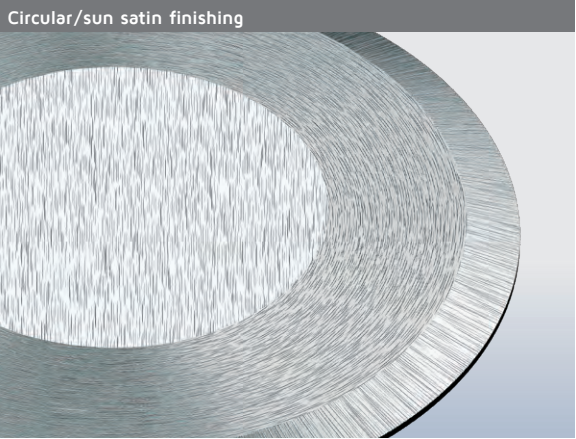


Central cooling

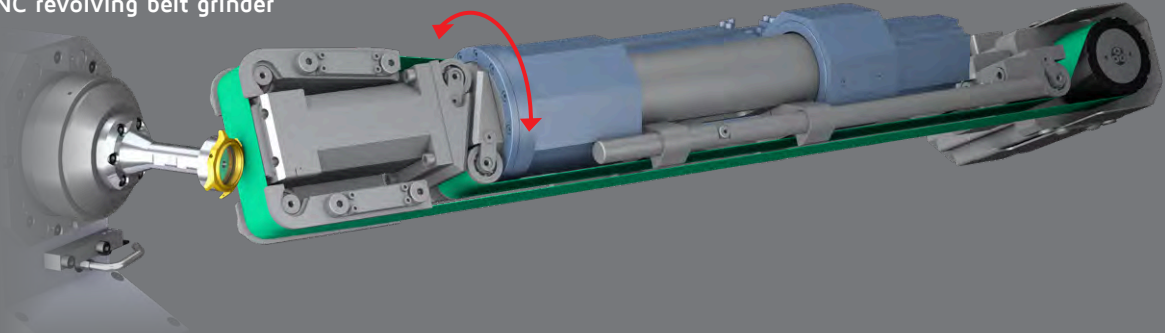


Satin finishing

The pivoting belt provides choice of direction for satin finishing while conserving a 5-axes kinematic, easy to program and sturdier.



CNC revolving belt grinder

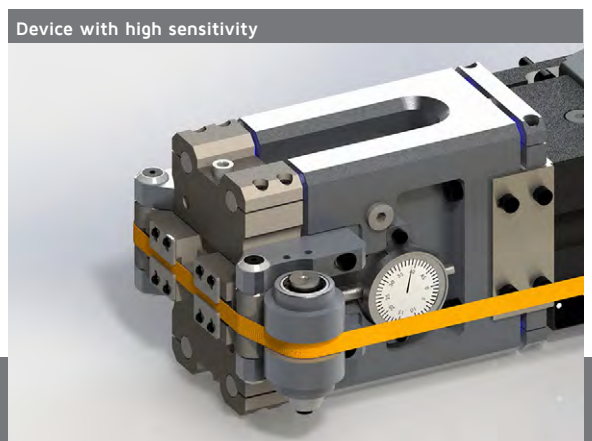
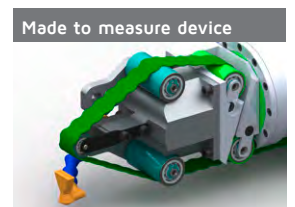
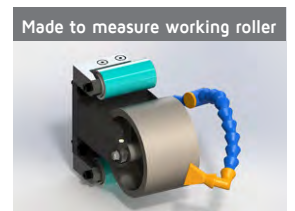
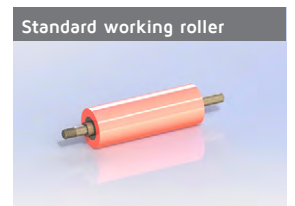
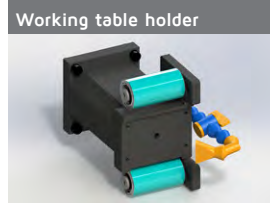
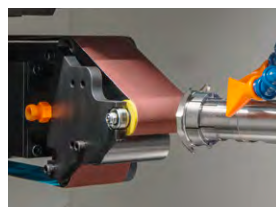
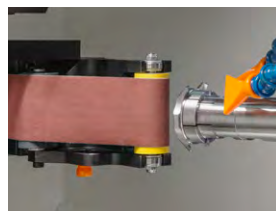
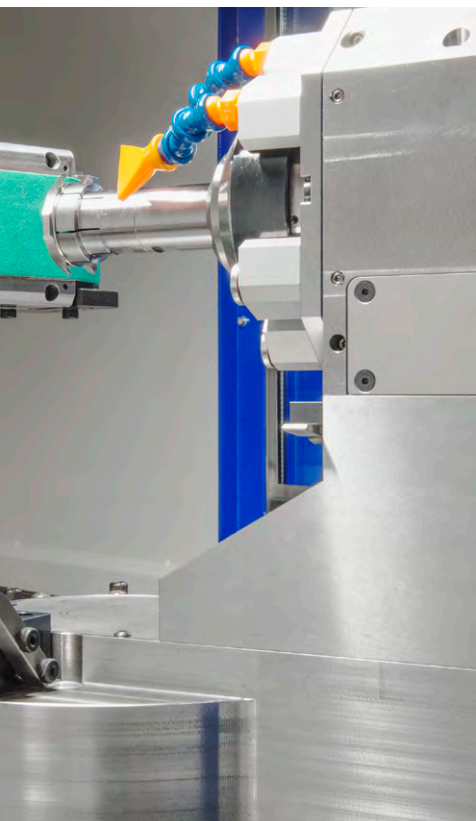


Tooling

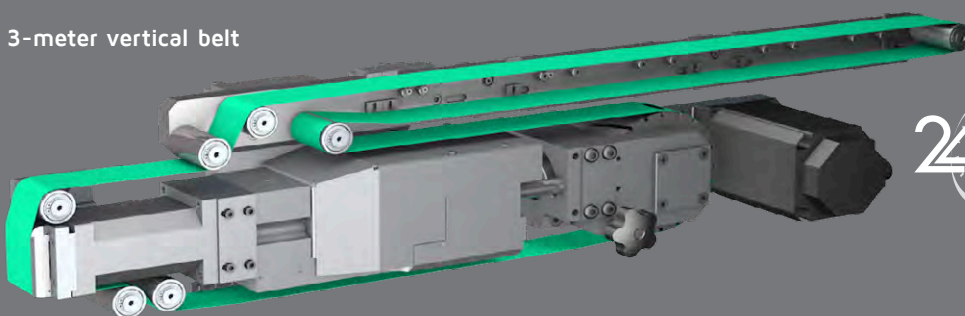
Extensive choice available

Belt tools

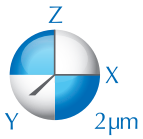
- 90° manual pivoting
- Roller + bearings can be changed independently
- Built-in cooling
- Quick-change base
- Sturdy Monobloc construction



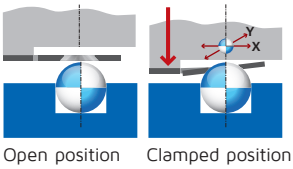
3-meter vertical belt



Clamping part

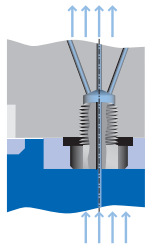


The YERLY zero point reference clamping principle



The perfect precision system

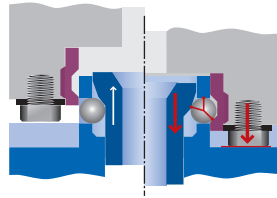
The Yerly system consists of a leaf spring and feet. During clamping, the 4 carbide balls and the warp of the leaf spring provide the positioning in X and Y of the system/chuck. The feet ensure the positioning on the Z-axis.



Compressed air supply

The YERLY clamping system uses the support feet as supply channels for compressed air for the following chuck functions:

- cleaning
- clamping the workpiece
- releasing the workpiece
- holding down or
- release of hold-down (swivelling clamping fingers)

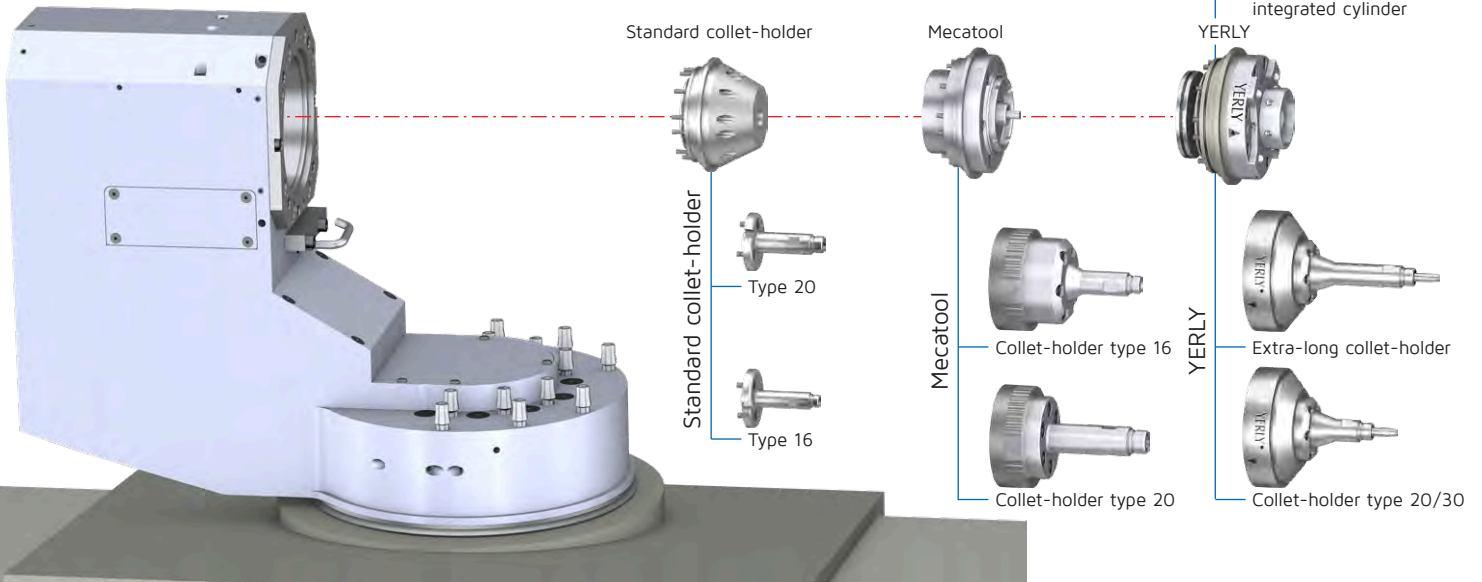
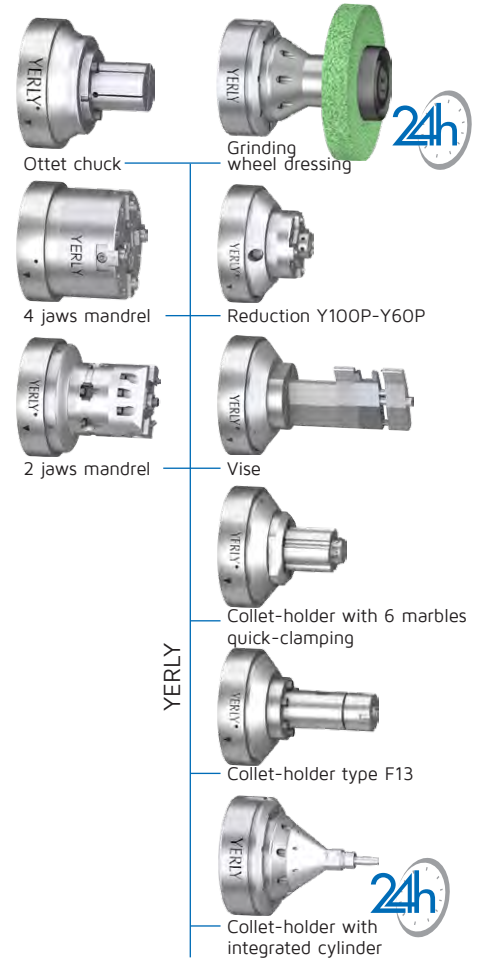


Pneumatic ball lock (32P, 60P, 100P, 140P)

As it travels down, the clamping cylinder forces the ball bearings against the annular cone which is screwed into the chuck. The chuck or the plate is thus pressed and stiffened on its base flange. The ball lock has a free inner passage which is always open for a tie rod or a thrust piece.



Cleaning of the Z reference surfaces through air nozzles, which guarantees precision in all situations.



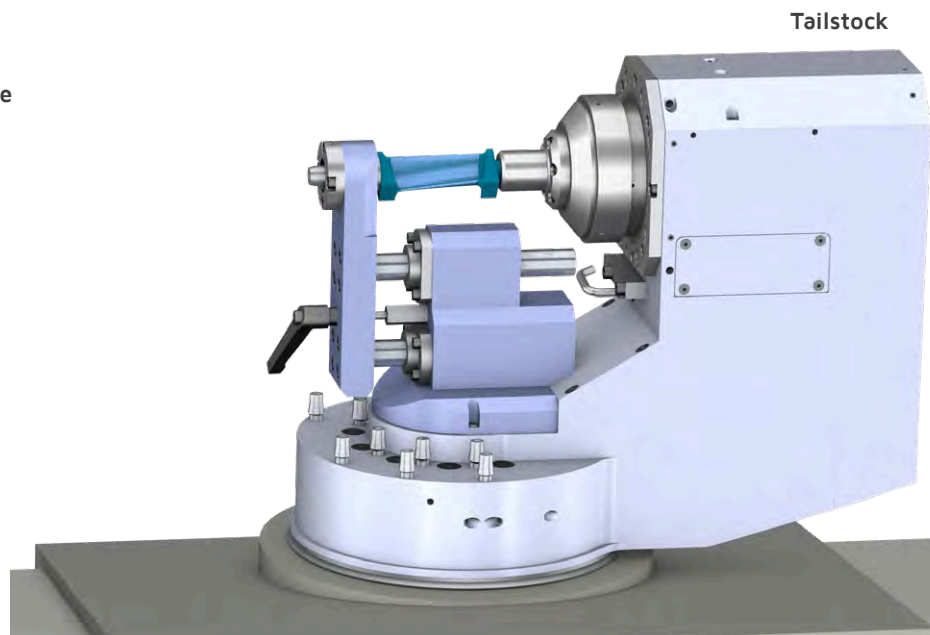
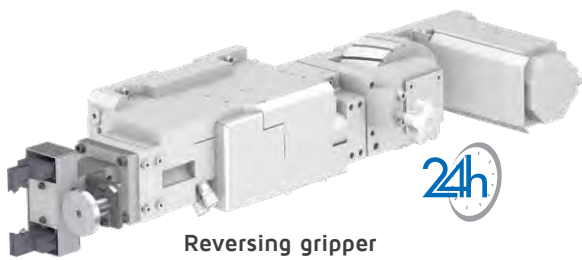
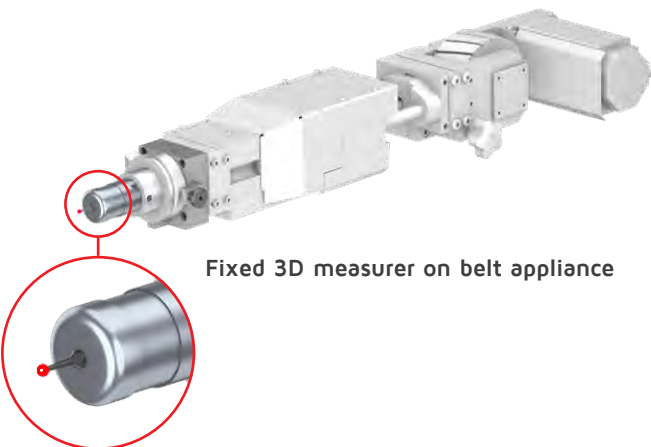
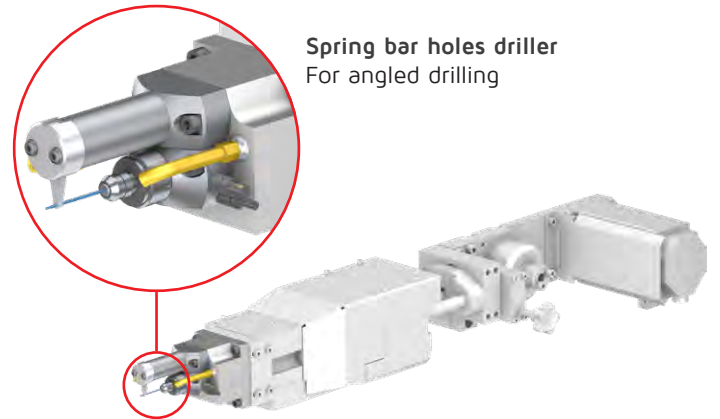
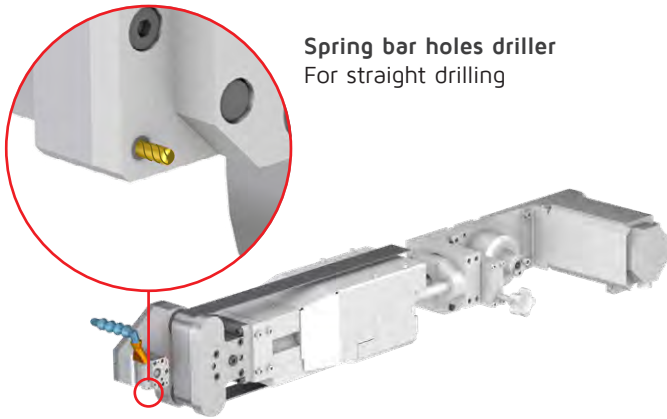
One week

Traditional production

Production possible through quick setup

SAVINGS

Various tools



The quick setup system enables 24h/24h use of the RECO-CT501

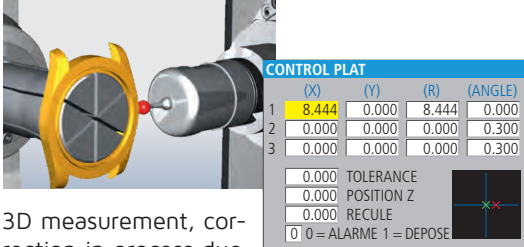


- Machining complex and challenging parts, for a limited batch size during the day.
- Fast setup at day's end to prepare for night production
- Automatic night production for series and/or long duration machining

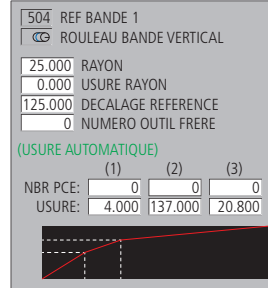
Fanuc control 30iB

New generation advanced 5-axis functions

- Tool center point control (TCP)
- Three dimensional tool radius correction (TRC)



3D measurement, correction in process due to a predefined macro.



Automatic management of tool wear provided by a semi-automatic wear curve learning process.

OPERATION				O0001 N00000000	
(ACT)	(NOM)	(TPS)	(CONV)		
1	E1(DIALO)	0	X		
1	E10(EB BDC 9H-3H)	0			
0	E20(EB COTE CORNE 1H-5H-7H-11H)	0			
1	E30(EB BOUT CORNE 1H-5H-7H-11H)	0			
1	E40(EB NISEAU COTE 1H-5H-7H-11H)	0			
0	E50(EB NISEAU DESS 1H-5H-7H-11H)	0			
1	E60(EB DESSUS CORNE 1H-5H-7H-11H)	0			
0	E70(SF BDC 9H-3H)	0			
0	E80(SF COTE CORNE 1H-5H-7H-11H)	0			
0	E90 (SF BOUT CORNE 1H-5H-7H-11H)	0			
0	E100(SF BISEAUCOTE 1H-5H-7H-11H)	0			
1	E110(SF BISEAU DESS 1H-5H-7H-11H)	0			
0	E120(SF DESS CORNE 1H-5H-7H-11H)	0			
1	E130(F BDC 9H-3H)	0			
0	E140(F COTE CORNE 1H-5H-7H-11H)	0			

NUM > MDI **** 08:46:56

Operations management for the part program.

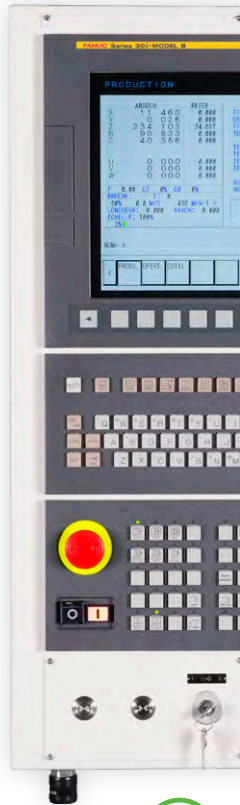
PRODUCTION				O0001 N00000000	
X	MACINE	RESTE	(REGLAGE E-C)	0.000	**** COTE E-C ****
Y	0.000	0.000	0.100		POSITION Y 11H
Z	83.970	0.000	0.000		POSITION X 11H
B	0.000	0.000	0.000		POSITION Y 1H
C	0.000	0.000	0.000		POSITION X 1H
U	0.000	0.000	0.000		POSITION Y 5H
V	0.000	0.000	0.000		POSITION X 5H
W	0.000	0.000	0.000		POSITION Y 7H
F	0.00 G1 0% GO 0%		0.000		POSITION X 7H
			0.000		**** RAYON E-C ****
	BROCHE : 1	T : 0	0.000		POSITION X 12H
	L : 41.000 R : 0.000 AUCUNE		0.000		PRESSION 12H
	0% OMIN-1 0.0M/S M 0		0.000		PRESSION 6H
	NB VAIALE # 532		0.300		POSITION X 6H
	NUM=>				

MDI **** EMG-ALM 08:46:56

Easy operation management for operator's figures.



Remote production management

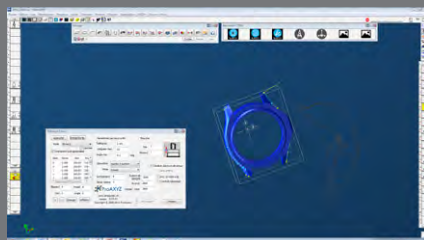


Automatic warming up and shutdown.

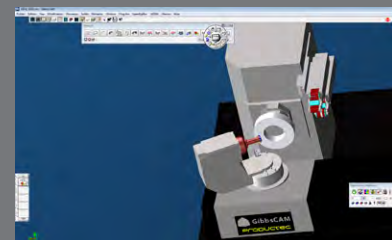
Offline programming



Programming



Simulation





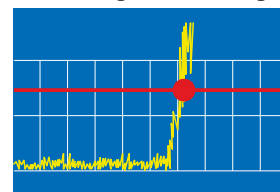
Remote maintenance

Monitoring cutting tool processes

Belt breakage



Monitoring motor charge



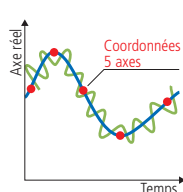
Management of tool library (grinding wheel, mill, drill, belt, dressing tool)

(No)	(COMMENTAIRE)	1	49A320 M10
1	RECOIII EC		MEULE DIAMETRE
2	RECOIII EC		
3			
4	44	121.400	RAYON
5	BRIN TANK AMERICAINE MINI	-0.245	
6	BRIN TANK AMERICAINE MINI	100.000	
7	I2345678901234567890123456	121.155	
8	FINITION EC PANTHERE PM	53.953	
9	COM BROCHE 12	50	
10	RECOIII EC		
11	COUVRANCE CALIBRE 38		
12	EB. CALIBR 38		
13	PLAT ENTRE-CORNE CLE 35MM	-0.015	
14	FINITION EC PANTHERE MM	4	
15	ENTE-CORNE CLE 31	16	
16	EBAUCHE EC PANTHERE PM	999	
17	RECOIII EC	353	
18	RECOIII EC		

Possibility to manage twin tools.

TAILLAGE MISE LARGEUR	OUTIL 1
CYCLE	0 CALI. PLAQUETTE
EBAUCHE	20 S [M/S]
FACE ARRIERE	-0.020 PROF/PASSE
FACE AVANT	0.200 F [MM/T]
DIAMETRE	0.000
MISE LARGEUR	0.000
EBAUCHE RAYON	0.000

Predefined dressing macros



```

O1200
G300X-12.8184Y-23.4395Z18.4460 67.7684C-139.3037F20000.U-
121.131V-21.359
G1X-12.6866Y-21.9224Z19.7434 9853V-21.359F3000
X-12.688Y-21.9151Z19.7524U-119.86V-21.359
X-12.6982Y-21.8622Z19.818867.8129C-139.3321U-119.93V-21.359
X-12.7083Y-21.8105Z19.8818867.7819C-139.3989U-119.8626V-21.359
X-12.7182Y-21.7599Z19.9439867.7516C-139.4642U-119.8364V-21.359
X-12.728Y-21.7105Z20.0042867.7221C-139.5279U-119.7914V-21.359
X-12.7375Y-21.6626Z20.0621867.6937C-139.5894U-119.748V-21.359
X-12.748Y-21.6106Z20.1249867.6628C-139.6561U-119.7009V-21.359
X-12.7584Y-21.5592Z20.1867867.6324C-139.7221U-119.6544V-21.359
X-12.7689Y-21.5075Z20.2481867.602C-139.7879U-119.6081V-21.359
X-12.7795Y-21.4562Z20.309867.5718C-139.8535U-119.562V-21.359
X-12.7901Y-21.4046Z20.3695867.5417C-139.9187U-119.5161V-21.359
    
```

Superposition of up to 3 virtual axis to slide, move or oscillate the 5-axis coordinates.

Complete ISO Code generation

```

G150          T2S3184M3P4
/G65P999      M7P7
(***) FRAISAGE **)
E10(FRAISAGE BISEAU 9H) G400Z-3.8H1004F1001R30.
T2S3184M3P4      G400Z-4H1004F1001R30.
M7P7           N30
G303Z-5W-2     E40(FRAISAGE P-C)
G400Z-3.8H1000F1001R30. T2S3184M3P4R0.07
T2S3184M3P4      M7P7
N10            G303Z-5W0
E20(FRAISAGE BISEAU 1H) G400Z1.1H1008F1001R30.
T2S3184M3P4      G400Z.6H1008F1001R30.
M7P7           G400Z.1H1008F1001R30.
G303Z-5W-2     G303Z-5W-5
G400Z-3.8H1002F1001R30. G400Z1.1H1008F1001R30.
G400Z-4H1002F1001R30. G400Z.4H1008F1001R30.
N20            G400Z.1H1008F1001R30.
E30(FRAISAGE BISEAU 5H) G400Z0H1008F1001R30.
    
```



Accessories

A range of equipment for

- Reducing floor footprint
- Controlling temperature
- Improving surface quality
- Releasing purified ambient air.

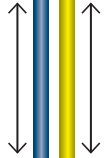


Releasing purified ambient air
 Elbaron electrostatic
 Elbaron mechanics
 Centralized

Oil filtration

- Edge
- Paper
- Centralized
- Centrifuge

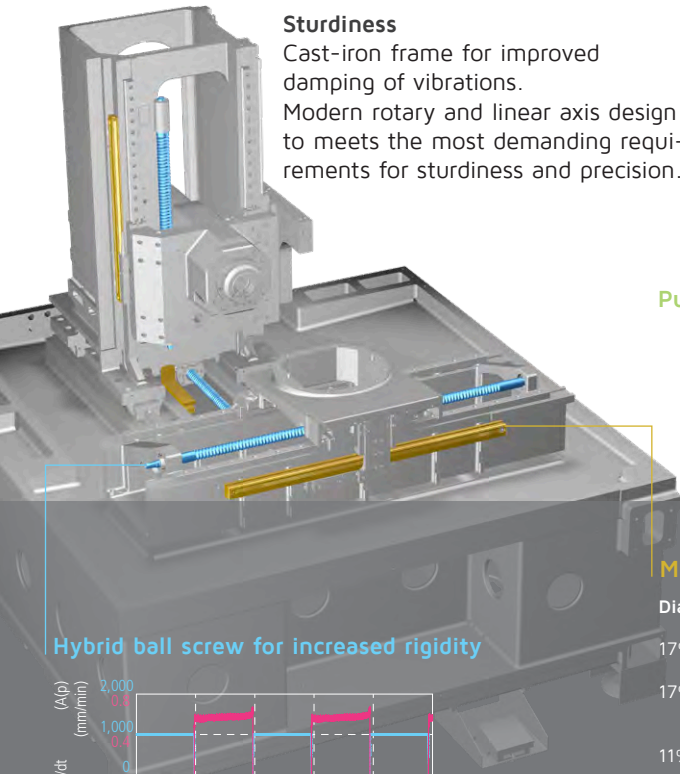
Water cooling



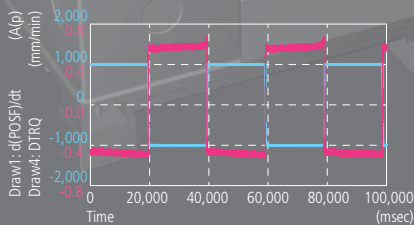
Ethernet network

Sturdiness

Cast-iron frame for improved damping of vibrations.
 Modern rotary and linear axis design to meets the most demanding requirements for sturdiness and precision.



Hybrid ball screw for increased rigidity



Pump for greasing

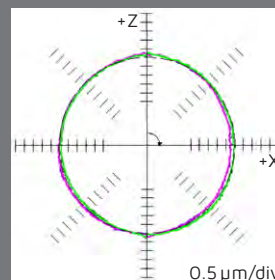
Pump for spindle lubrication

Evacuation pump

Magnetic linear encoder for increased precision

Diagnostiques Ballbar (%)

- 17% Différence d'échelle 3.0 µm
- 17% Pics d'inversion Z ▲ 1.0 µm ▼ 1.5 µm
- 11% Pics d'inversion X ▶ 0.1 µm ◀ 1.0 µm
- 8% Jeu à l'inversion X ▶ 0.1 µm ◀ 0.7 µm
- 7% Rectitude Z 1.3 µm



Technical characteristics

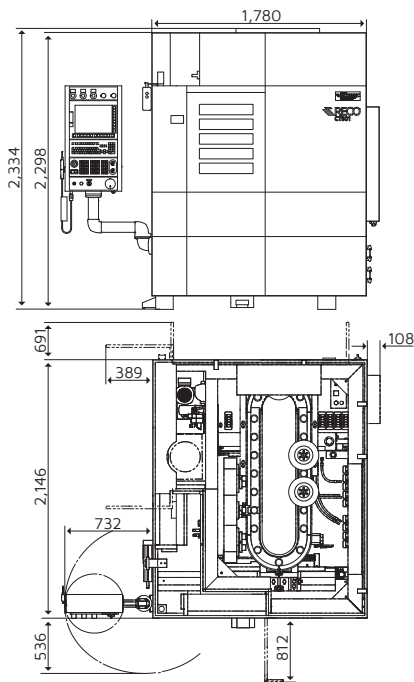


Integrated fire extinguisher

Electrical cabinet

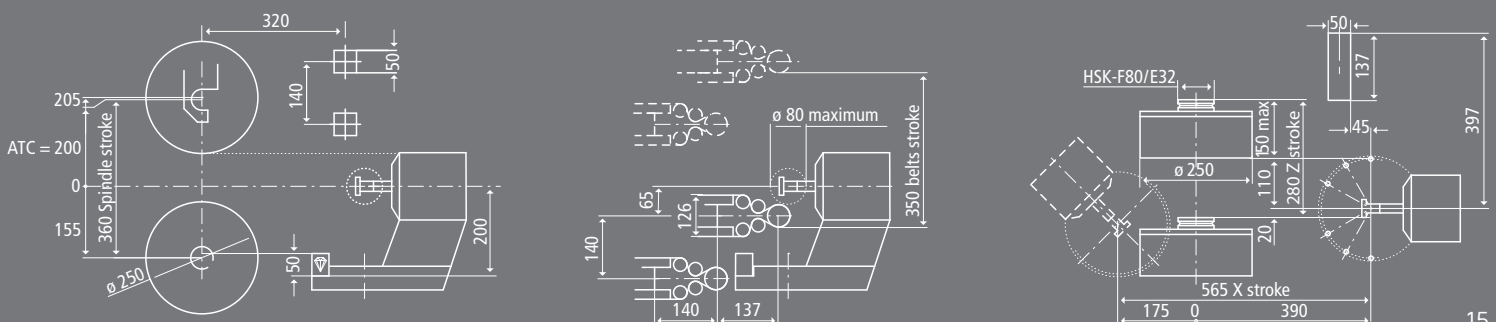
Quality electrical components inside an air conditioned cabinet with easy access.

Dimensions



	18,000 rpm	60,000 rpm
Part		
Min-max workpiece ϕ	20 – 80 mm	
Tool spindle		
Maximum wheel ϕ	250 mm	150 mm
Overall maximum tool length	150 mm	
Nominal spindle power	16.5 kW	6.5 kW
Maximum spindle speed	12,000/18,000 rpm	60,000 rpm
Automatic clamping	HSK-F80	HSK-E32
Cooling	Water	
Tool changer capacity	Up to 20	
Type of tools	Lapping disks, grinding wheels, mill, drill ...	
Double belt system		
Type of band (standard)	50 x 1,500 mm	
In option	50 x 3,000 mm	
Working angle	0° – 90° Manual rotating	
Working speed	0.2 – 25 m/s	
Type of tools	A) Flat or shape plate in hard metal B) Rollers ϕ 10 – 49 mm (bigger on demand)	
Axes		
Number of axes (simultaneous)	6 (5)	
X axis travel	565 mm	
YM axis travel	360 mm (spindle)	
YB axis travel	350 mm (band)	
Z axis travel	280 mm	
B axis travel	290° (depending on tool)	
C axis travel	360° (spindle)	
Linear axes Y, YM, YB, Z		
Max. speed	30 m/min	
Rotary axes B + C		
Type of drive	Torque motor	
Theoretical accuracy/repeatability	\pm 4 sec/ \pm 1 sec	
C axis speed	1,400 rpm	
Peripheral equipment		
Machining liquid	Oil	
Workpiece removal (option)	Manual (robot)	
Control		
Type	CNC FANUC 30iB	
Programming	ISO, macro assisted	
Installation		
Dimensions (Length x width x height)	2.15 x 2.1 x 2.35 m	
Weight	~ 4,100 kg	
Installed power	22 kVA	
Air pressure	6 bar	

Machine travel layout





RECO-MR401
High-level production for grinding between watch case lugs & watch case side.



RECO-MS300
Satin finishing on complex surfaces by abrasive belts.



RECO-MM3PCII
Finishing simple part with convex geometry.



BULA-POLIGO B1
Finishing transfert machine



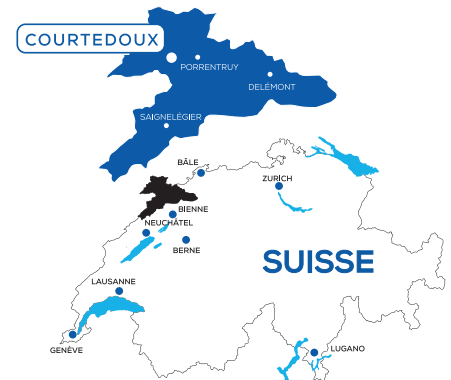
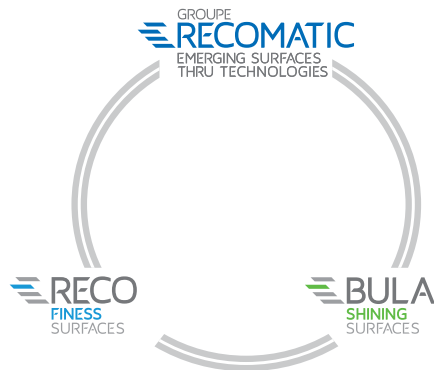
BULA-POLIGO B2
Polishing-brightening-brushing-deburring



BULA-POLIGO B3
complex parts



Two companies, One partner
for all finishing and polishing
applications.



Sous réserve de modifications, données non contractuelles, juin 2017



GROUP RECOMATIC
Rue des Marronniers 1G
2905 Courtedoux
SUISSE

t +41 (0)32 465 70 10
f +41 (0)32 466 43 51
info@groupecomatic.ch
www.groupecomatic.ch

