

# SW-12 SERIES

ULTRA-PERFORMANCE SWISS TURNING CENTERS



THE ULTIMATE MACHINING POWER  
**WOODWAY**

# ULTRA-PERFORMANCE SWISS TURNING CENTERS

On account of accuracy tiny parts processing request, GOODWAY SW-12 ultra-performance swiss turning center designed concept is based on compact machine size and combine with complete tooling system, hybrid guide bush and rapid feed rate, to provide high speed, high accuracy, complicated processing capability. Bring the best production solution for clock, medical industry.



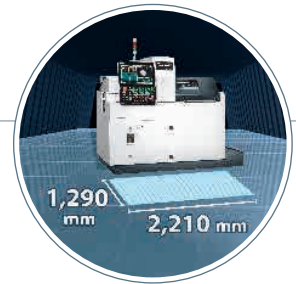
**Micro diameter parts processing capability**

According to micro diameter parts processing request to develop max. turning dia. Ø13 mm, max. turning length 140 mm ( with guide bush ).



**High speed automatic production capacity**

Complete loading/unloading interface with 32 m/min. rapid feed rate to provide more quick tool changing and more efficiency automatic production.



**Higher production per unit yield**

By means of compact design to accomplish SW-12 with extremely small land area and raise large capacity per unit area.

**MACCHINE UTENSILI NUOVE ED USATE**

115 100 75 50 25 0 mm

Ø3 mm / SUS316

Ø2 mm / SUS304

Ø4 mm / Titanium alloy

Ø4 mm / Titanium alloy

Ø3 mm / SUS316

Ø2 mm / SUS304

Ø4 mm / Titanium alloy

Ø4 mm / Titanium alloy



# FLEXIBLE TOOLING SYSTEM



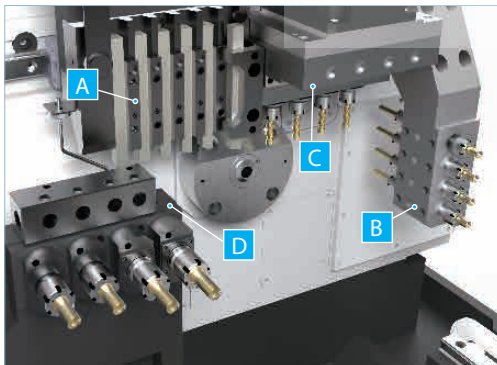
( Sub-spindle and rear-end tooling are optional )

## Standard



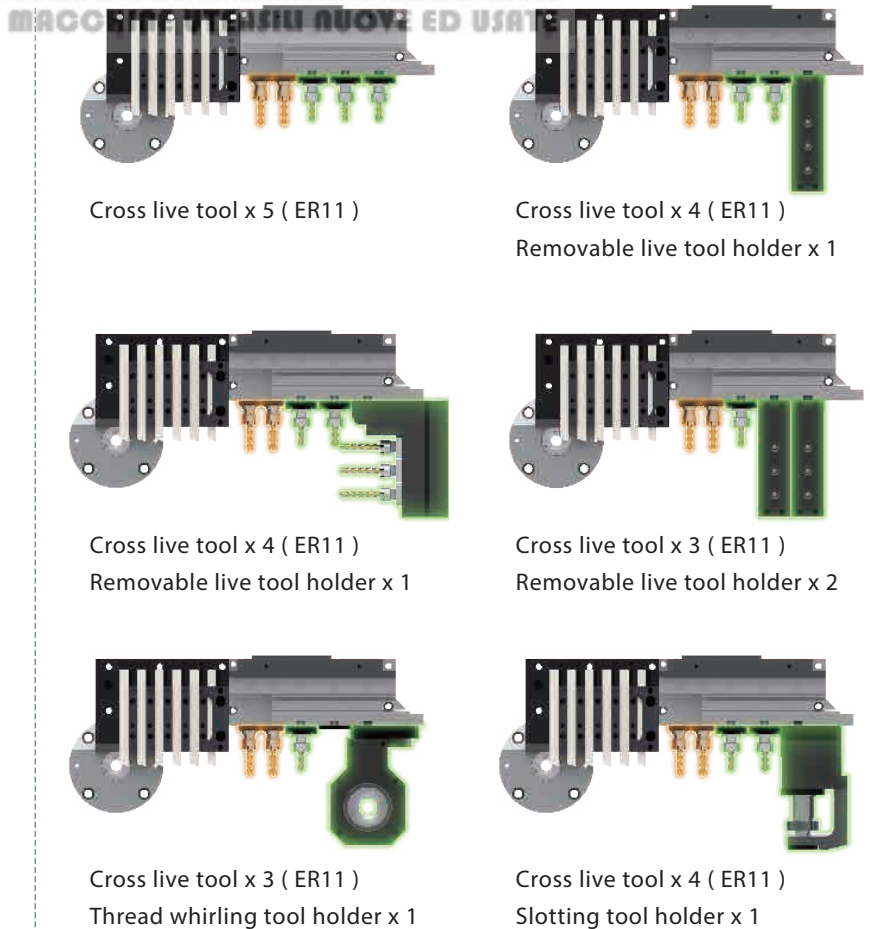
## Expansion

- Fixed tool position
- Changeable tool position



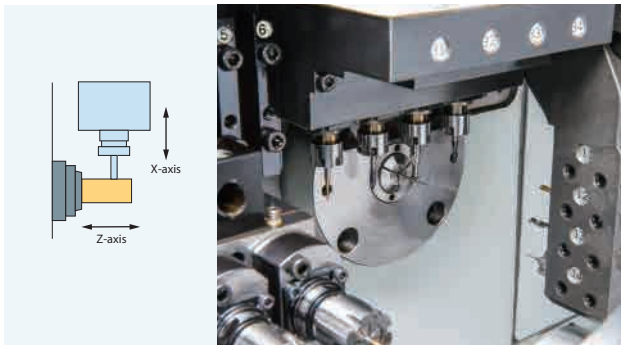
Tooling system		Number of tools
<b>A</b>	O.D. tool	6
<b>B</b>	I.D. tool	
	Front-end	4
	Rear-end	4
<b>C</b>	Cross live tool	4*1
<b>D Backworking tooling system ( Opt. )</b>		
	I.D. tool	
	Live tool	
	Rear-end	4 (total)

\*1 Tool numbers depends on different tools operation, please refer to right drawing.

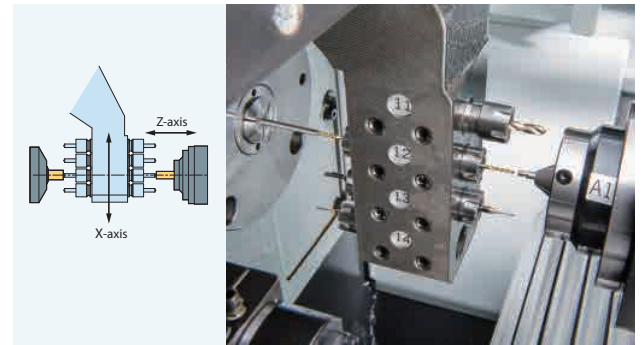


# MACHINING VARIATIONS

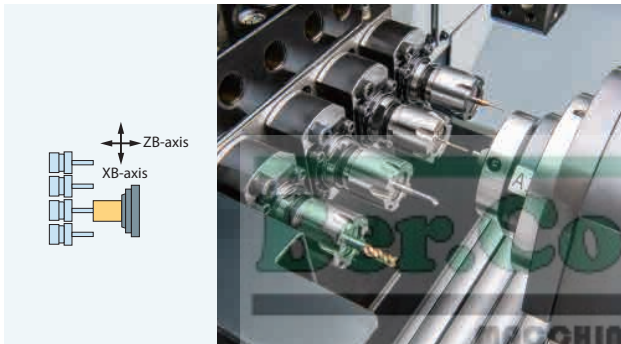
## Cross machining



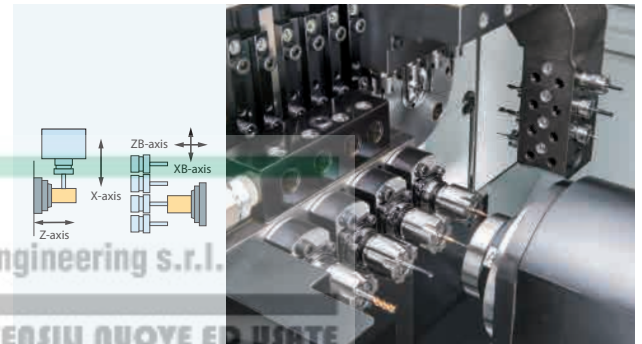
## Front / Rear simultaneous drilling & tapping



## Rear off-center drilling & tapping



## Main & Sub-spindle simultaneous machining



## C-axis control

Working with the live tooling and 0.001° high resolution C-axis enables the machine to perform multiple tasks, such as drilling, tapping, and milling operations, including cylindrical and polar coordinate interpolations.



## Thread whirling

By using multiple cutters of thread whirling tools and technology of pneumatic coolant to remove the chips to achieve the demand of machining high speed and high accuracy of thread.



## Slotting

Using slotting driven tools to provide high efficiency and extend tool life compare to normal end milling tools.



## Deep hole drilling

One deep hole drill tool position on sub-spindle body, it can do high rigid deep drilling and tapping by ZB axis. With high pressure coolant system, it can ensure the best deep hole drill performance. ( Please see page 6 )



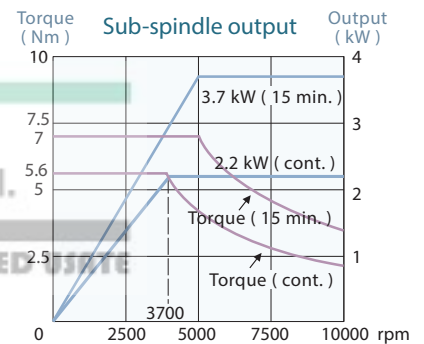
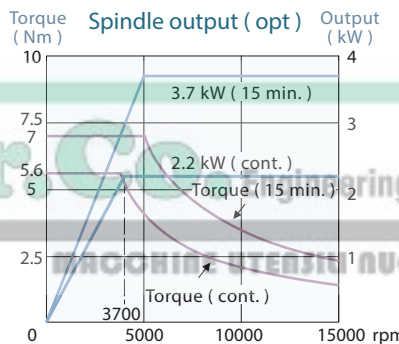
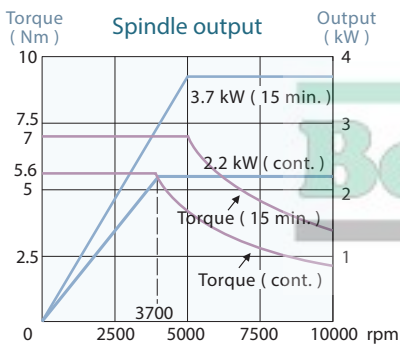
# ADVANCED STRUCTURE DESIGN

## High speed built-in spindle



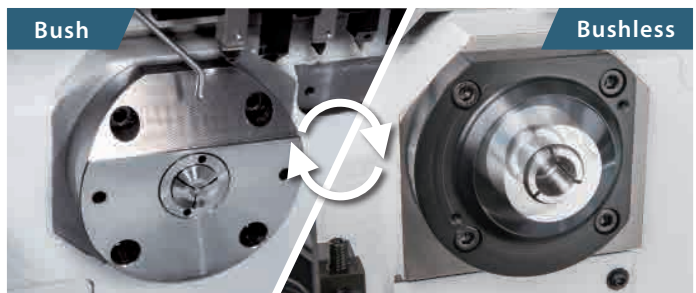
Main spindle and sub-spindle both use built-in motor design with 3.7 kW powerful motor output, max. spindle speed 15,000 rpm (opt.) that can satisfy high speed accuracy processing request.

- ▶ The built-in motor design reduces centrifugal force effects and minimizes spindle vibrations, which increases the spindles life span and improves long-term machining accuracy.
- ▶ Sub-spindle parts ejector can let finished part separate from clamping and fall into parts catcher in order to increase productivity.
- ▶ Parts clamping by pneumatic system, not only with abundant clamping force, quick movement but also equip with energy saving and many advantages.



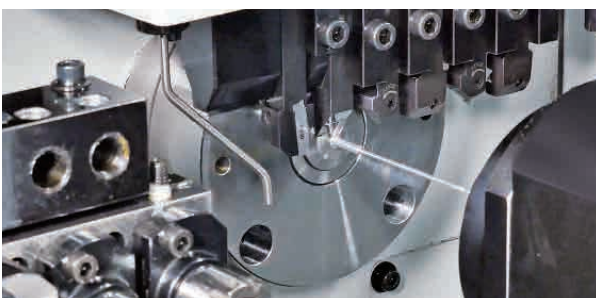
## Hybrid guide bush

Guide bush can be installed or dismantle which depends on individual processing. Two processing ways on one machine make processing more flexible.



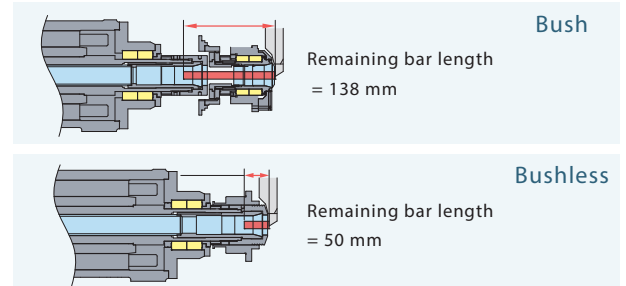
Suitable for long parts

**Bush** ▶ Processing by using guide bush can control the flexibility of long parts to make sure the ultimate accuracy.



Suitable for short parts

**Bushless** ▶ Processing by using bushless mode can shorten the remaining bar length to save production cost



# NC INTELLIGENCE **G.LINC 350** option

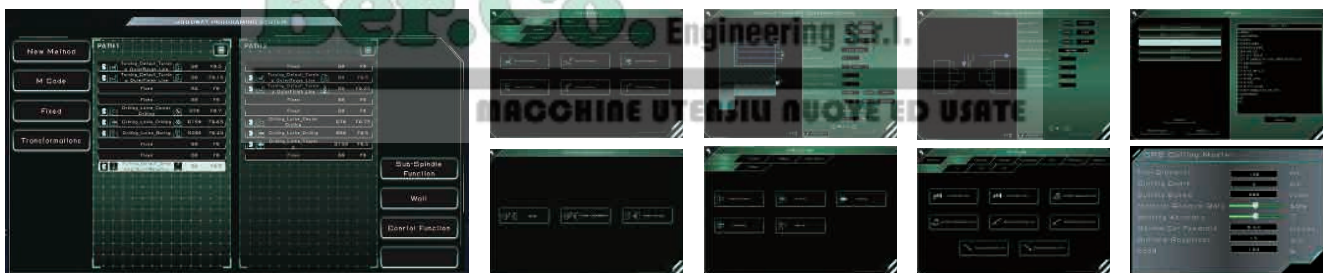


## Advanced Hardware Combined with Intelligent Software, Makes Your Machine Smarter

- ▶ Advanced hardware
- ▶ Outstanding operability
- ▶ Streamlined programming
- ▶ High security and shortened machining setting
- ▶ Reliable continuous operation
- ▶ Shortened troubleshooting time
- ▶ Improved utilization rate
- ▶ 3D cutting simulation preview

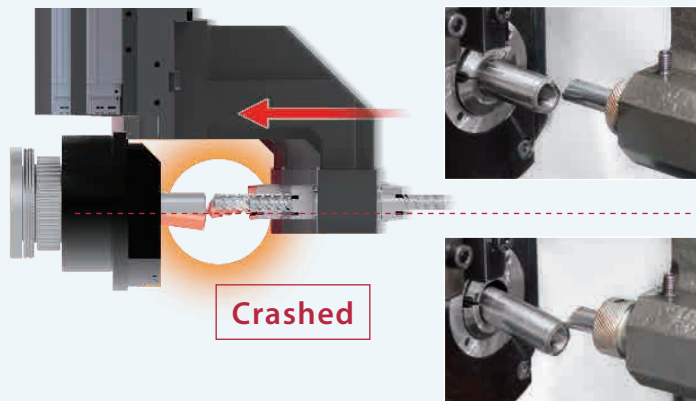
## Comprehensive Functions

Programming	Setting	Test-Run	Actual Production	Daily Used
Dynamic graphic display Program management Friendly programing environment Programming auxiliary Manual Guide <i>i</i> Embedded E-manual	3D advance tool path and cutting simulation	Tool load monitor Program check Smart balance etection 3D Real-time cutting simulation Interference check (31 <i>i</i> option needed)	Tool load monitor 3D Real-time cutting simulation Interference check (31 <i>i</i> option needed) Load monitoring	Safety signal viewer Fast alarm check productivity Productivity management Twin operation system switch Maintenance management NFC apply authority management and record



## AIR BAG FUNCTION

Standard with air bag function for maximum protection and also minimum the damage when machine crash which can save the cost of repair machines and production lost because of machine broken.



### Equipped with air bag

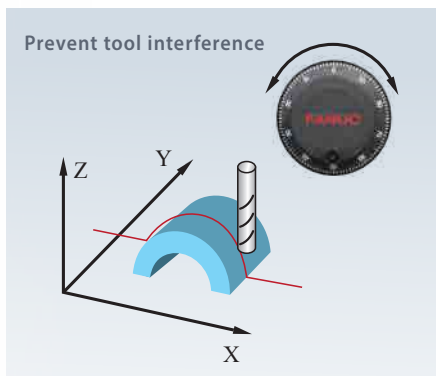
**Retract tools within 0.009 second**

Machine crash → EMG mode → Servo motor reverse rotary within 0.009 second → Machine stop

### Not equipped with air bag

After machine crashed, axes continue feeding, machine structure might get damaged seriously.

# STANDARD & OPTIONAL FEATURES



Manual handle retrace



Parts catcher



Parts catcher box

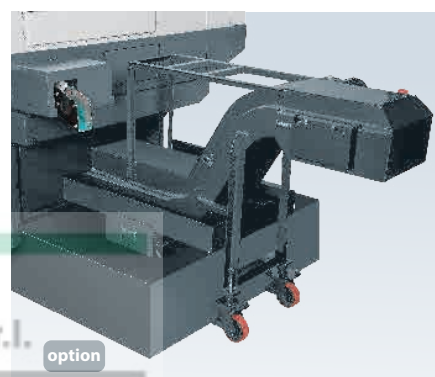


Elevating roof type protection door



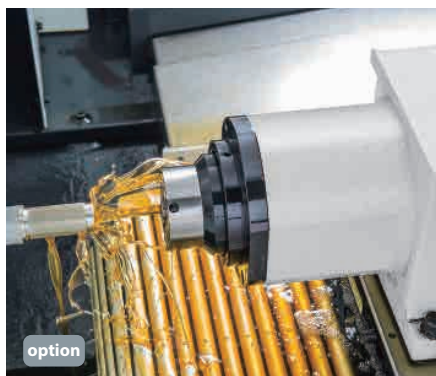
option

Parts conveyor



option

Chip conveyor



option

Coolant through sub-spindle



option

A/C cooling system



option

Long parts ejector



- ▶ Compact machine size.
- ▶ Filter for open loop.
- ▶ Use disposable filter bag.
- ▶ Built-in the pressure is too low or too high alarm.

Models	SP 1000	SP 2000	SE 500	SE 1000	SE 1500
<b>Max. pressure</b>	70 bar (kg/cm <sup>2</sup> ) 1,000 PSI <sup>*1</sup>	140 bar (kg/cm <sup>2</sup> ) 2,000 PSI <sup>*1</sup>	35 bar (kg/cm <sup>2</sup> ) 500 PSI	70 bar (kg/cm <sup>2</sup> ) 1,000 PSI	100 bar (kg/cm <sup>2</sup> ) 1,500 PSI
<b>Max. flow rate</b>	12 LPM (3 GPM) <sup>*1</sup>	19 LPM (5 GPM) <sup>*1</sup>	25 LPM (6.6 GPM)	25 LPM (6.6 GPM)	24 LPM (6.3 GPM)
<b>Max. load</b>	2.2 kW (3 HP)	5.5 kW (7.5 HP)	2.2 kW (3 HP)	5.5 kW (7.5 HP)	7.5 kW (10 HP)

\*1 Was tested with temperature : 40°C / viscosity : 46 CST oil in 220V, 60Hz.  
Pressure output would change according to the oil temperature, voltage and frequency.



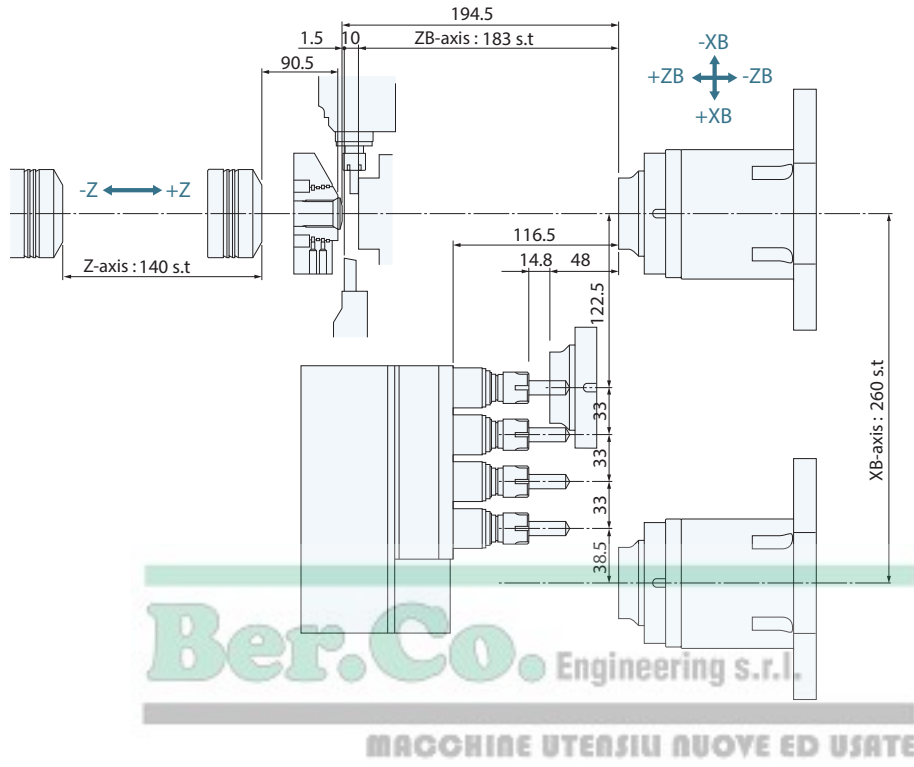
option

High-pressure coolant system

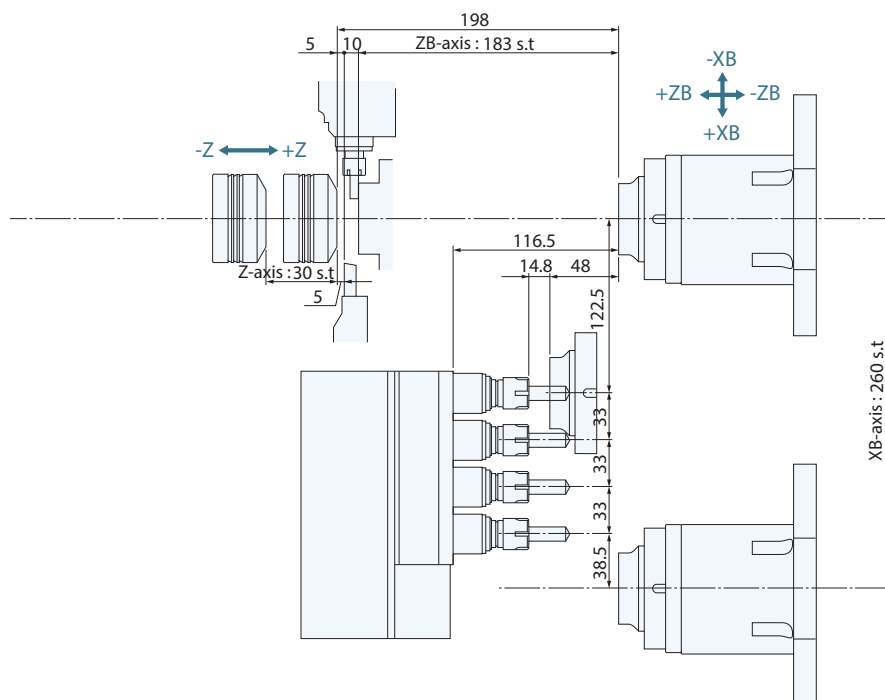


# DIMENSIONS

## Bush

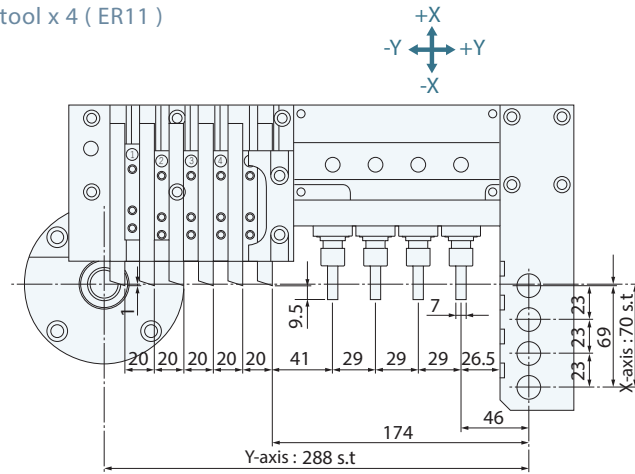


## Bushless



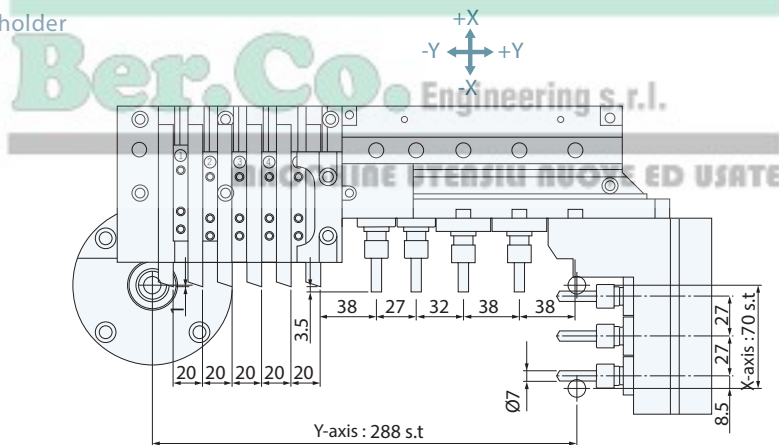


O.D. tool x 6 (□10) + Live tool x 4 (ER11)



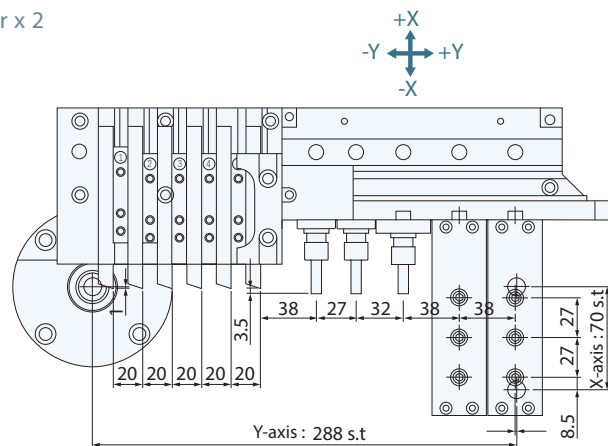
O.D. tool x 6 (□10) + Live tool x 4 (ER11)

+ Removable live tool holder



O.D. tool x 6 (□10) + Live tool x 3 (ER11)

+ Removable live tool holder x 2



Unit : mm

# STANDARD & OPTIONAL FEATURES

S : Standard      O : Option  
 - : Not Available    C : Contact Goodway

		SW-12
<b>SPINDEL</b>		
Main spindle motor configuration		S
Rigid tapping		S
C-axis		S
Spindle brake		S
<b>WORK HOLDING</b>		
Spindle hardness collect		O
Spindle tungsten collect		O
Sub-spindle hardness collect		O
Sub-spindle tungsten collect		O
Special work holding chuck		O
<b>GUIDE BUSH</b>		
Stationary guide bush		O
Revolving guide bush		O
Rotary magic guide bush		O
Tungsten guide bush		O
<b>COOLANT</b>		
Coolant pump		S
High-pressure coolant system	5.0 MPA	O
	7.0 MPA	O
	10 MPA	O
	14 MPA	O
Roll-out coolant tank		S
Coolant flow switch		S
Coolant level switch		S
<b>CHIP DISPOSAL</b>		
Chip conveyor		O
Chip cart with coolant drain		O
Oil mist collector		O
<b>LIVE TOOLING</b>		
ER11 cross live tool		O
ER11 3-spindle front-end live tool		O
ER11 2-spindle front-end live tool		O
ER11 rear-end live tool		O
ER16 cross live tool		O
ER16 3-spindle front-end live tool		O
ER11 2-spindle drill/milling unit		O
Slotting holder		O
Thread whirling holder		O
<b>AUTOMATIC OPERATION SUPPORT</b>		
Bar feeder		O
Bar feeder interface		S
Parts catcher		S
Parts conveyor		O
Long parts ejector		O
<b>SAFETY</b>		
Fully enclosed guarding		S
Door interlock (incl. Mechanical lock)		S
Impact resistant viewing window		S
Low hydraulic pressure detection switch		S
Over travel (soft limit)		S
Load monitoring function		S
Cut-off detector		S
<b>OTHERS</b>		
Electrical cabinet	A/C cooling system	O
	Heat exchanger	S
Hydraulic system		S
Pneumatic system		S
Advanced auto lubrication system		S
Oil cooler		O

FANUC CONTROL FUNCTIONS		Oi-TF	31i
Display	10.4" color LCD	S	S
Graphic function	Standard	S	S
	Dynamic	O	O
Part program storage size	512 K bytes	S	-
	1 M bytes	O	S
	Oi-TF : each path	-	O
	31i : total	-	O
Registerable programs	400	S	-
	500	O	-
	Oi-TF : each path	-	S
	31i : total	-	O
Tool offset pairs	99	-	S
	128	S	-
	200	O	O
	Oi-TF : each path	-	O
31i : total	499	-	O
	999	-	O
	2000	-	O
	Servo HRV control	HRV 3	S
Automatic data backup		S	S
Synchronous / Composite control		S	S
Superimposed Control		S	S
Inch / metric conversion		S	S
Polar coordinate interpolation		S	S
Cylindrical interpolation		S	S
Multiple repetitive cycle		S	S
Rigid tapping		S	S
Unexpected disturbance torque detection function		S	S
Spindle orientation		S	S
Constant surface speed control		S	S
Spindle speed fluctuation detection		S	S
Embedded macro		S	S
Spindle synchronous control		S	S
Background editing		S	S
Tool radius / Tool nose radius compensation		S	S
Multi-language display		S	S
Cs contour control		S	S
Polygon turning		S	S
Helical interpolation		S	S
Direct drawing dimension programming		S	S
Thread cutting retract		S	S
Variable lead threading		S	S
Multiple repetitive cycle II		S	S
Canned cycles for drilling		S	S
Synchronous / Composite / Superimposed control by program command		S	S
Tool nose radius compensation		S	S
Chamfering / Corner R		S	S
AI contour control I		O	S
Multi part program editing		S	S
Manual handle retract		S	S
Manual intervention and return		S	O
External data input		S	S
Addition of custom macro		S	S
Increment system C		S	S
Run hour & parts counter		S	S
Auto power-off function		S	S
RS-232 port		S	S
Memory card input / output (CF + USB)		S	S
Ethernet		S	S

Specifications are subject to change without notice.

# MACHINE SPECIFICATIONS

■ : Metric ■ : Inch

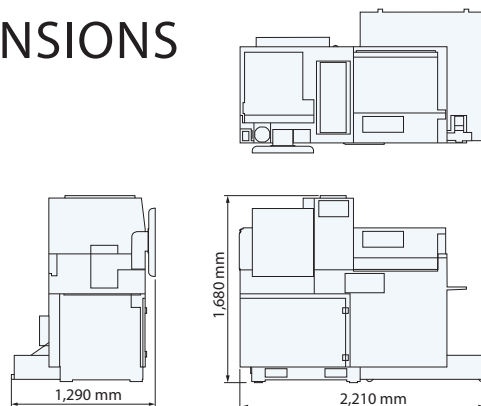
			SW-12	
Working range	Max. machining diameter		Ø 13 mm 0.51"	
	Max. turning length per chuck	Hybrid guide bush	140 / 30 mm 5.5" / 1.18" ( Bush / Bushless )	
O.D. tools	Number of tools		6	
	Shank size		□ 10 mm 2/5"	
I.D. tools	Number of tools		4	
	Sleeve size		ER11	
	Max. drilling capacity		Ø 8 mm 0.31"	
	Max. tapping capacity		M6 x P1.0	
Cross live tools	Number of tools		4	
	Max. live tooling speed		10,000 rpm	
	Servo motor output		0.75 kW 1 HP	
	Sleeve size		ER11	
	Max. drilling capacity		Ø 6 mm 0.23"	
Main spindle	Max. tapping capacity		M5 x P0.8	
	Max. end mill capacity		Ø 7 mm 0.27"	
	Max. speed		10,000 rpm ( Opt. 12,000 / 15,000 rpm )	
	Spindle motor output ( cont. / 15 min. )		2.2 / 3.7 kW 3 / 5 HP	
Min. indexing increment		0.001°		
X / Y / Z / XB / ZB axes rapids			32 m/min. 1,259 IPM	
NC controller			FANUC 31 i-B	
Spindle center height			1,060 mm 41.7"	
Coolant tank capacity			200 L 52.8 gal	
Machine dimensions			2,210 x 1,290 x 1,680 mm 88" x 51" x 67"	
Machine weight			1,750 Kg 3,900 lb	

## Backworking Tooling System

Rear-end machining capability	Max. chucking diameter		Ø 13 mm 0.51"	
	Max. length for front ejection		80 mm 3.14"	
	Max. parts projection length		30 mm 1.18"	
Rear-end tools	Number of tools		4	
	Max. live tooling speed		8,000 rpm	
	Servo motor output		0.75 kW 1 HP	
	Max. drilling capacity ( I.D. tools )		Ø 8 mm 0.31"	
	Max. drilling capacity ( live tools )		Ø 6 mm 0.23"	
	Max. tapping capacity ( I.D. tools )		M6 × P1.0	
Sub-spindle	Max. tapping capacity ( live tools )		M5 × P0.8	
	Max. sub-spindle speed		10,000 rpm	
	Sub-spindle motor output ( cont. / 15 min. )		2.2 / 3.7 kW 3 / 5 HP	
	Min. indexing increment		0.001°	

Specifications are subject to change without notice.

## MACHINE DIMENSIONS



Unit : mm





**Ber.Co.** Engineering s.r.l.

MACCHINE UTENSILI NUOVE ED USATE

**GOODWAY MACHINE CORP.**



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