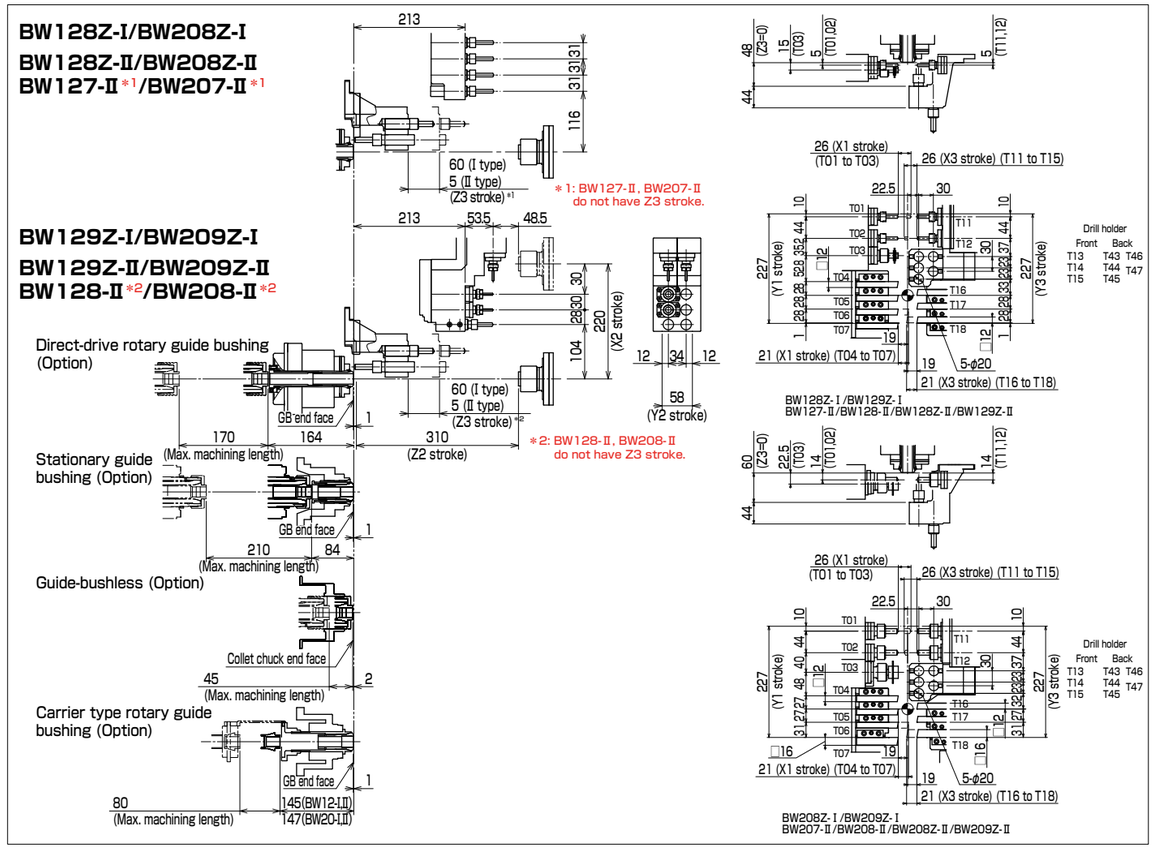
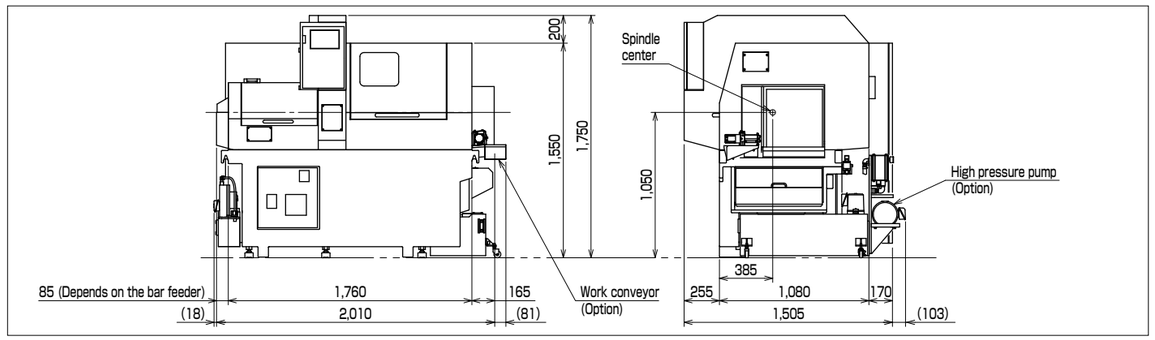
Tooling zone



Layout



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The specifications of this catalogue are subject to change without prior notice.

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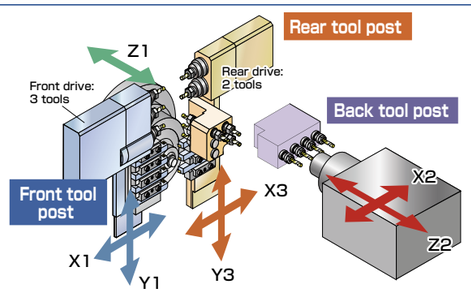
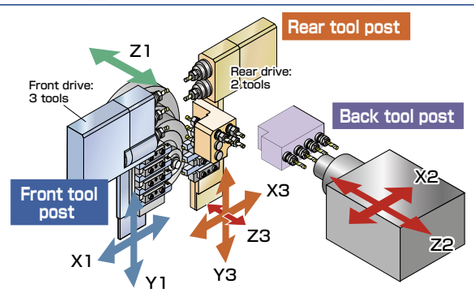
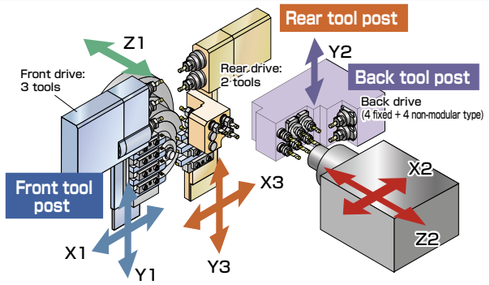
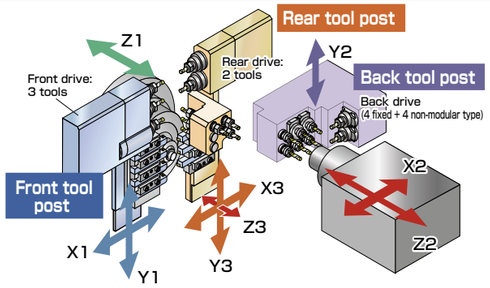
PRECISION TSUGAMI

CNC Precision Automatic Lathe

BW128Z-I/BW129Z-I
BW208Z-I/BW209Z-I
BW127-II/BW128-II
BW128Z-II/BW129Z-II
BW207-II/BW208-II
BW208Z-II/BW209Z-II

Drastically improved productivity by diverse simultaneous processing

Achieves high productivity

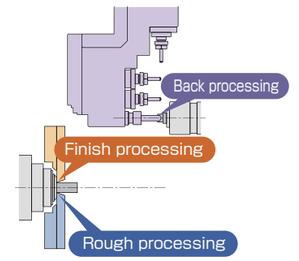
	Without Z3 axis	With Z3 axis (Stroke for -Ⅰ:60 mm, -Ⅱ: 5 mm)
Without Y2 axis		
	BW127-Ⅱ/BW207-Ⅱ	BW128Z-Ⅰ/BW208Z-Ⅰ BW128Z-Ⅱ/BW208Z-Ⅱ
With Y2 axis		
	BW128-Ⅱ/BW208-Ⅱ	BW129Z-Ⅰ/BW209Z-Ⅰ BW129Z-Ⅱ/BW209Z-Ⅱ

- The combination of independent opposed tool posts and the back tool post with Y axis enables the diverse simultaneous processing.
  (BW129Z-Ⅰ/BW209Z-Ⅰ, BW128-Ⅱ/BW129Z-Ⅱ/BW208-Ⅱ/BW209Z-Ⅱ)
- With the Z axis movement on the rear tool post by 60mm, processing on the rear tool post is possible even when pullback of the bar stock is unable.
  (BW128Z-Ⅰ/BW129Z-Ⅰ/BW208Z-Ⅰ/BW209Z-Ⅰ)
- Moving the rear tool post 5 mm in Z-axis direction makes center alignment between the front and rear tool posts easier.
  (BW128Z-Ⅱ/BW129Z-Ⅱ/BW208Z-Ⅱ/BW209Z-Ⅱ)
- Independent opposed tool post minimizes the tool change time by calling the next tool on the other side tool post.
- Automatic programming software (Abile) allows to create the program with 3-path controlled machining easily. (Standard)

Diverse simultaneous processing

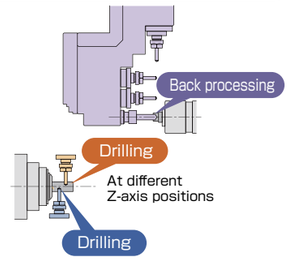
Machining patterns

Balance turning



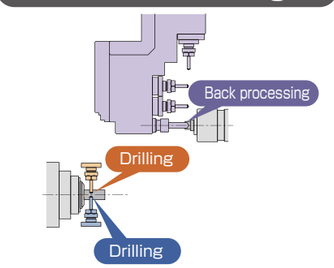
BW127-Ⅱ BW207-Ⅱ	BW128-Ⅱ BW208-Ⅱ	BW128Z-Ⅰ/Ⅱ BW208Z-Ⅰ/Ⅱ	BW129Z-Ⅰ/Ⅱ BW209Z-Ⅰ/Ⅱ
○	○	○	○

Simultaneous drilling at different Z-axis positions



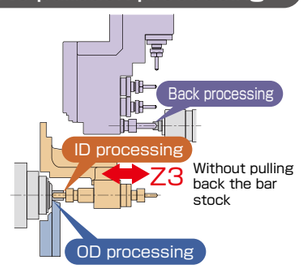
BW127-Ⅱ BW207-Ⅱ	BW128-Ⅱ BW208-Ⅱ	BW128Z-Ⅰ BW208Z-Ⅰ	BW128Z-Ⅱ BW208Z-Ⅱ	BW129Z-Ⅰ BW209Z-Ⅰ	BW129Z-Ⅱ BW209Z-Ⅱ
—	—	○	—	○	—

Simultaneous drilling



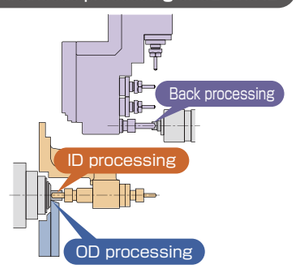
BW127-Ⅱ BW207-Ⅱ	BW128-Ⅱ BW208-Ⅱ	BW128Z-Ⅰ/Ⅱ BW208Z-Ⅰ/Ⅱ	BW129Z-Ⅰ/Ⅱ BW209Z-Ⅰ/Ⅱ
○	○	○	○

No pullback processing



BW127-Ⅱ BW207-Ⅱ	BW128-Ⅱ BW208-Ⅱ	BW128Z-Ⅰ BW208Z-Ⅰ	BW128Z-Ⅱ BW208Z-Ⅱ	BW129Z-Ⅰ BW209Z-Ⅰ	BW129Z-Ⅱ BW209Z-Ⅱ
—	—	○	—	○	—

Simultaneous processing of OD and ID



BW127-Ⅱ BW207-Ⅱ	BW128-Ⅱ BW208-Ⅱ	BW128Z-Ⅰ/Ⅱ BW208Z-Ⅰ/Ⅱ	BW129Z-Ⅰ/Ⅱ BW209Z-Ⅰ/Ⅱ
○	○	○	○

Front drive/rear drive are provided as standard

Drilling, tapping or milling from cross direction is executed with the main spindle C-axis control.

Front drive

Item		BW12-I/II series	BW20-I/II series
Rotation speed		Max. 8,000 min^{-1} (Rated speed: 7,000 min^{-1}) *1	
Type of live tools	Upper, Middle	Modular type Standard: ER11 *2	Modular type Standard: ER16 *2
	Lower	Modular type Standard: ER16 *2	Modular type Standard: ER20 *2

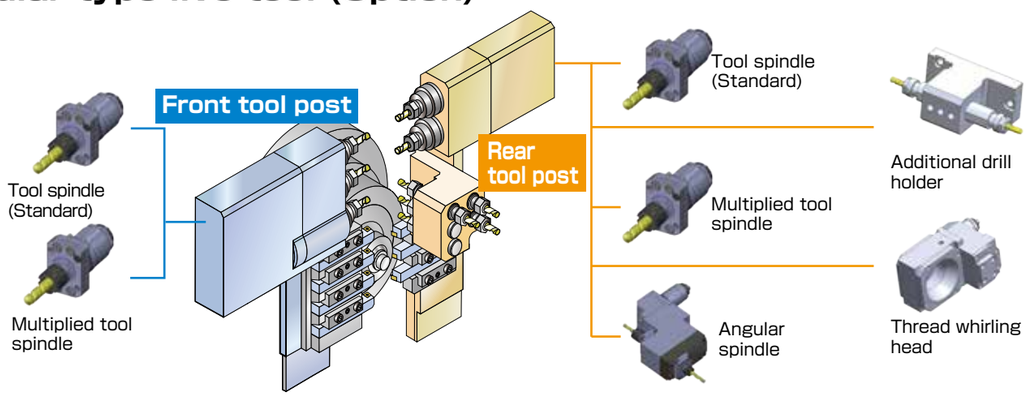
*1 The rotation more than the rated speed should be short period.
*2 Tool spindle is provided as standard.

Rear drive

Item	BW12-I/II series	BW20-I/II series
Rotation speed	Max. 8,000 min^{-1} (Rated speed: 7,000 min^{-1}) *1	
Type of live tools	Modular type x 2 holes Standard: ER11 *2	Modular type x 2 holes Standard: ER16 *2

*1 The rotation more than the rated speed should be short period.
*2 Tool spindle is provided as standard.

Modular type live tool (Option)



Front drive *1	
Multiplied tool spindle	Max. speed: 20,000 min^{-1} (Rated speed: 16,000 min^{-1}) *2 ER11

*1 The rotation speed may be limited by the installed options.
*2 The rotation more than the rated speed should be short period.

Rear drive *1	
Multiplied tool spindle	Max. speed: 20,000 min^{-1} (Rated speed: 16,000 min^{-1}) *2 ER11
Angular spindle	Inclined angle: 0 to 10 deg BW12-I/II series: ER11 BW20-I/II series: ER16
Thread whirling head	Inclined angle: 0 to 20 deg Max. machining dia.: ϕ9 mm Max. speed: 4,000 min^{-1}
Additional drill holder	ϕ20 mm × 1 hole (Mountable on front/back)

Back tool post with Y axis

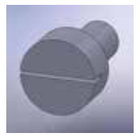
Off-center drilling, tapping, end milling, and cross drilling on the back side can be performed simultaneously with the front side.

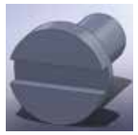
Processing patterns on back side

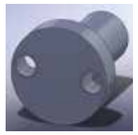

End milling

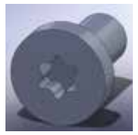

Cross drilling and tapping


Cross off-center drilling and tapping


Slotting


End face milling


Off-center drilling and tapping


Torx-shape processing

Item	Specifications	
Live tool	Back	Cross
	ER11×2	ER11×2
	Max. speed: 8,000 min^{-1} (Rated speed: 6,400 min^{-1}) *	
Fixed tool	ϕ20mm × 4 holes	—

* The rotation more than the rated speed should be short period.

Item	Specifications
Max. drilling dia.	ϕ6 mm *1
Max. tapping dia.	M5 *2
Motor output	1.0 kW

*1 Machining capacity is equivalent to JIS S45C.
*2 Tapping capacity is based on the cutting tap.

Direct-drive rotary guide bushing (Option)

Built-in motor eliminates causes of vibration during high speed machining. The stable geometrical accuracy and the surface roughness are secured.

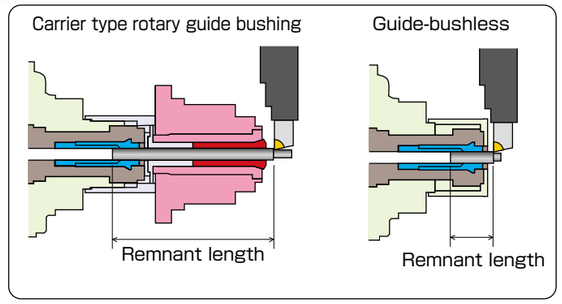
	Rotation speed	Max. machining length
BW12-I/II series	Max. 12,000 min^{-1} (Rated speed: 8,000 min^{-1}) *	170 mm
BW20-I/II series	Max. 10,000 min^{-1} (Rated speed: 8,000 min^{-1}) *	170 mm

* The rotation more than the rated speed should be short period.

Guide-bushing type or guide-bushless type is selectable (Option)

Guide bushing and guide-bushless are switchable by user. Optimal machining is possible according to product accuracy or length.
The guide-bushless does not require ground bars, and enables high precision machining from cold-drawn bars.

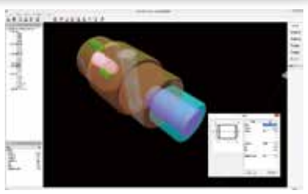
■Stationary guide bushing
■Carrier type rotary guide bushing
■Direct-drive rotary guide bushing
■Guide-bushless



	Stationary guide bushing	Carrier type rotary guide bushing	Direct-drive rotary guide bushing	Guide-bushless
Remnant length	120 mm+α mm	180 mm+α mm	210 mm+α mm	30 mm+α mm

Automatic programming software (Abile)

Program for 3-path controlled machine can be created easily and quickly by the PC-based automatic programming system (standard).



Machine specifications

	Item	BW127-II	BW128-II	BW128Z-I	BW128Z-II	BW129Z-I	BW129Z-II	BW207-II	BW208-II	BW208Z-I	BW208Z-II	BW209Z-I	BW209Z-II
Machining range, Machining capacity	Bar stock chucking dia.	ϕ3mm to ϕ12mm						ϕ3mm to ϕ20mm					
	Max. back spindle chucking dia.	ϕ12 mm						ϕ20 mm					
	Max. machining length	210 mm (Stationary guide bushing *1), 80 mm (Carrier type rotary guide bushing *1), 170 mm (Direct-drive rotary guide bushing *1), 45 mm (Guide-bushless *1)											
	Max. main spindle drilling dia.	ϕ7 mm						ϕ10 mm					
	Max. main spindle tapping dia.	M6						M10					
	Max. back spindle drilling dia.	ϕ7 mm						ϕ8 mm					
	Max. back spindle tapping dia.	M8											
	Max. live tool drilling dia.	ϕ6 mm (Front tool post, Rear tool post, Back tool post) (* Back tool post: Option for models without Y2 axis)											
	Max. live tool tapping dia.	M5 (Front tool post, Rear tool post, Back tool post) (* Back tool post: Option for models without Y2 axis)											
	Max. live tool slotting cutter dia.	ϕ30 mm (Front tool post: T03)						ϕ45mm (Front tool post: T03)					
	Stroke (Z3 axis)	—		60 mm	5 mm	60 mm	5 mm	—		60 mm	5 mm	60 mm	5 mm
Machine	Main spindle speed	Max. 12,000 min-1 (Rated speed: 10,000 min-1) *2						Max. 10,000 min-1 (Rated speed: 8,000 min-1) *2					
	Back spindle speed	Max. 12,000 min-1 (Rated speed: 8,000 min-1) *2											
	Rotary guide bushing speed	Carrier type *1: Max. 8,000 min-1 (Rated speed: 6,000 min-1) *2 Direct-drive type *1: Max. 12,000 min-1(Rated speed: 8,000 min-1) *2						Carrier type *1: Max. 8,000 min-1 (Rated speed: 6,000 min-1) *2 Direct-drive type *1: Max. 10,000 min-1(Rated speed: 8,000 min-1) *2					
	Live tool speed	Front/rear tool post: Max. 8,000 min-1 (Rated speed: 7,000 min-1) *2 Back tool post: Max. 8,000 min-1 (Rated speed: 6,400 min-1) *2 (Back tool post: Option for models without Y2 axis) *3 T03 of front tool post: Max.5,000 min-1 (Rated speed: 4,000 min-1) *2											
	Tool storage capacity (Standard)	24	28	24	28	24	28	24	28				
	Tool size	12 mm × 12 mm × 85 mm						12 mm × 12 mm × 85 mm (T04, T05, T06, T16, T17) 16 mm × 16 mm × 85 mm(T07, T18)					
	Rapid traverse rate	32 m/min (Z1, X2, Z2) 24 m/min (Y1, Y3)						15 m/min (Y2) *3 12 m/min (X1, X3, Z3) *4					
Motors	Main spindle	1.5/2.2 kW						2.2/3.7 kW					
	Back spindle	1.5/2.2 kW											
	Linear axes	0.5kW (All of X, Z, Y axis)											
	Live tool	1.0 kW (Front tool post, Rear tool post, Back tool post) (* Back tool post: Option for models without Y2 axis)											
	Coolant pump	0.25 kW											
	Lubricating oil pump	3W											
Power supply and others	Weight	2,850 kg	2,900 kg	2,850 kg		2,900 kg		2,850 kg	2,900 kg	2,850 kg		2,900 kg	
	Power source requirement	13.2 kVA	13.7 kVA	13.7 kVA		14.1 kVA		14.4 kVA	14.9 kVA	14.9 kVA		15.4 kVA	
	Compressed air requirement	0.4MPa or more											
	Air discharge rate	50 NL/min											
	Coolant tank capacity	120L											
	Width x Depth x Height	2,010 mm × 1,505 mm × 1,750 mm											

*1 Option
*2 The rotation more than the rated speed should be short period.
*3 The 6 models with Y2 axis are BW129Z-I, BW209Z-I, BW128-II, BW129Z-II, BW208-II, BW209Z-II.
*4 The 8 models with Z3 axis are BW128Z-I, BW129Z-I, BW208Z-I, BW209Z-I, BW128Z-II, BW129Z-II, BW208Z-II, BW209Z-II.

NC specifications

Item	Specifications	Item	Specifications
Controlled axes	X1, Z1, Y1, X2, Z2, Y2*1, X3, Z3*2, Y3, C1, C2	Number of tool offset	200 (sum of all paths)
Least input increment	0.001mm (X-axis in diameter)	LCD/MDI	10.4" color LCD
Max. programmable value	±8 digits	Display language	Japanese / English
Interpolation method	Linear, Circular	Part program storage size	64Kbyte (sum of all paths)
Feedrate	1 to 6,000 mm/min	Number of registerable programs	63 (sum of all paths)
Feedrate override	0 to 150% in 10% increments	Miscellaneous functions	M5-digits
Dwell	G04 0 to 99999.999	Spindle functions	S5-digits
Absolute/incremental command	X, Z, Y, C: Absolute U, W, V, H: Incremental	Tool functions	T4-digits

*1 The 6 models with Y2 axis are BW129Z-I, BW209Z-I, BW128-II, BW129Z-II, BW208-II, BW209Z-II.
*2 The 8 models with Z3 axis are BW128Z-I, BW129Z-I, BW208Z-I, BW209Z-I, BW128Z-II, BW129Z-II, BW208Z-II, BW209Z-II.

Machine standard accessories

Item	Item	Item
Front drive: 3 tools	Main/back spindle adapter	Live tool air purge
Rear drive: 2 tools	Door interlock (Tooling zone/Headstock area)	Automatic cut-off function/ Automatic facing function
Back drive (4 fixed + 4 non-modular type) *1	Coolant level switch	Internal light (Tooling zone/Headstock area)
C-axis control for main/back spindles (Brake is an option.)	Spindle cooling unit	Retractable coolant nozzle
Automatic programming software (Abile)	Standard tools	Front drill holder
Tool height compensation function	Transit clamps	Back drill holder *2
Tool counter	Automatic power shut off	Tool spindle (for front drive)
Periodic maintenance screen	Main/back spindle air purge	Tool spndle (for rear drive)

*1 Only for BW128-II, BW208-II, BW129Z-I, BW209Z-I, BW129Z-II, BW209Z-II
*2 Only for BW127-II, BW207-II, BW128Z-I, BW208Z-I, BW128Z-II, BW208Z-II

NC standard accessories

Item	Item	Item
Chasing function	Spindle synchronous control (rotation/phase)	Canned drilling cycle
Continuous thread cutting	Z1-Z2 synchronous control	Rigid tap (Main spindle, Back spindle)
Manual pulse generator	Tool geometry/wear offset	Cut-off detection (Speed differential type)
Memory card I/O interface	Programmable data input	Spindle speed fluctuation detection
Background editing	Chamfering & corner R	HRV control
Run time & parts number display	Tool nose radius compensation	Fixed data setting screen
Custom macro	Multiple repetitive cycle	
Constant surface speed control	Extended program editing	

Options

Item		Item	
Guide bushing	Stationary guide bushing	Tooling	Adapter for non-round bar (main/back spindle)
	Carrier type rotary guide bushing		Spindle liner
	Direct-drive rotary guide bushing		Drill holder
	Guide-bushless		Center-adjustable double heads drill holder
Spindle functions	Main spindle brake		Additional drill holder
	Back spindle brake		Tool set gauge
High accuracy functions	0.1 μm resolution	NC functions	Part program storage size: 128 Kbyte
	Coolant temperature controller		Part program storage size: 256 Kbyte
	Touch switch for X2 axis		Part program storage size: 512 Kbyte
Live tools (Front tool post)	Multiplied tool spindle *1		Registerable programs expansion #1 (64 Kbyte: 120 programs)
	Hobbing unit (Front drive) *2		Registerable programs expansion #1 (128 Kbyte: 250 programs)
Live tools (Rear tool post)	Multiplied tool spindle *1		Registerable programs expansion #1 (256 Kbyte: 500 programs)
	Angular spindle *1		Registerable programs expansion #1 (512 Kbyte: 1,000 programs)
	Thread whirling head *3		Direct drawing dimension programming
Live tools (Back tool post)	Back drive (2 fixed + 2 modular type) *4		Variable-lead thread cutting
	Back tool spindle		Thread cutting cycle retract
	Back cross spindle		Helical interpolation
	Fixed-tool adapter		Polar coordinate interpolation
Coolant	High pressure pump		Cylindrical interpolation
	M code oil blow		Display language
	Wavy nozzle		Manual handle retrace function
Work discharge	Work conveyor		Inch/metric conversion
	Work catcher	Safety and other	Mist collector
	Work tray		Automatic fire extinguisher
	Front discharge		Fire damper
	Rear discharge		Coolant flow switch
Chip disposal	Chip conveyor		Bar feeder interface
	Chip carrier		Rigid tap (Live tool)
Machine maintenance and Monitoring functions	Cut-off detection (Touch switch type)		RS232C input/output interface
	Tool load monitor (live tool, main spindle, back spindle)		Abnormal load detection
	Signal indicator		3-dimensional coordinate conversion
	MT-LINK i		Shift amount setting for spindle phase synchronization control
	AI servo monitor *5		Automatic setting of pick-up position (G430-G431)
Tooling	Collet chuck with carbide lining		Torque limit skip for Z2 axis (G432)

*1 The stroke is limited for BW12-I/II. *2 The live tools of front drive (3 tools) are eliminated.
*3 When mounting the thread whirling head, other live tools of rear tool post cannot be used.
*4 Only for BW128Z-I, BW208Z-I, BW127-II, BW207-II, BW128Z-II, BW208Z-II *5 MT-LINK i (option) is additionally required.