

SL 4000 Series

HORIZONTAL TURNING CENTER



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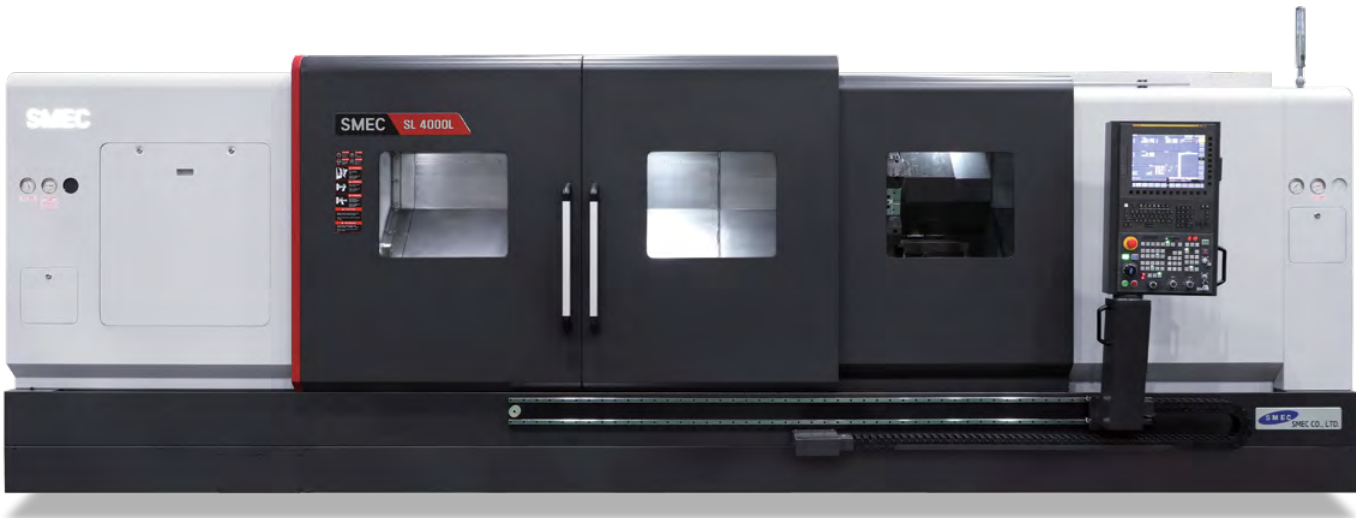
- SL 4000 Series
- SL 4000X
 - SL 4000XM
 - SL 4000L
 - SL 4000LM

SL 4000 Series

SL 4000X/XM/L/LM

Heavy duty and precision machining in a compact footprint with ease of use features

- 45 degree TORQUE TUBE RIB bed to support heavy duty machining
- High precision machining possible during heavy duty cutting
- Significantly reduced non-cutting time for high efficiency machining
- Servo turret for improved high speed performance
- Low center of gravity design minimizing vibration and thermal growth for high precision turning



Category		SL 4000AX AXM	SL 4000BX(BXM)	SL 4000AL(ALM)	SL 4000BL(BLM)
Swing over bed	mm(inch)	770	770	770	770
Max turning length	mm(inch)	2,128 2,084(83.78 82.05)	2,087 2,042(82.17 80.39)	3,128 3,084(123.15 121.42)	3,087 3,042(121.54 119.76)
Chuck size	inch	12"	15"	12"	15"
Spindle bore	mm(inch)	115(4.53)	132(5.20)	115(4.53)	132(5.20)
Spindle speed	rpm	2,500	2,000	2,500	2,000
Main Motor(cont./max)	kW(Hp)	18.5/26(24.81/34.87)	18.5/26(24.81/34.87)	18.5/26(24.81/34.87)	18.5/26(24.81/34.87)
Travels X	mm(inch)	340(13.39)	340(13.39)	340(13.39)	340(13.39)
Travels Z	mm(inch)	2,170(85.43)	2,170(85.43)	3,170(124.80)	3,170(124.80)
No of tool positions	EA	12(BMT75)	12(BMT75)	12(BMT75)	12(BMT75)

Superb spindle structure

The radiator fin head assembly to minimize thermal growth and Bzi sensor increases rotation accuracy for high quality machining

Optimized feed system design

The pre-tensioned double anchored feed system and 6 contact surface x-axis slideway frame enables high precision and heavy duty cutting

High rigidity design

The 45-degree slanted bed with torque tube ribbed structure supresses vibration during heavy duty cutting for high precision machining

Operator centered convenience features

Operator convenience maximized with features such as M-CODE based programmable tailstock, Manual Guide i and operator centered panel

Superb spindle design



Radiator fin head assembly
to minimize thermal growth

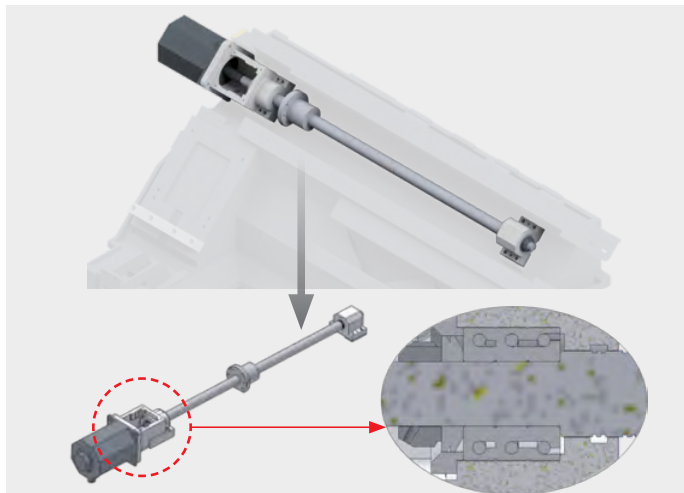
The radiator fin like ribbed structure of the head assembly minimizes thermal growth for precision machining



Reduced service issues with new
spindle orientation sensor design

Spindle orientation sensor changed from position encoder to Bzi sensor, removing the need to adjust the timing belt and improving rotation accuracy and increasing productivity by removing a point of maintenance

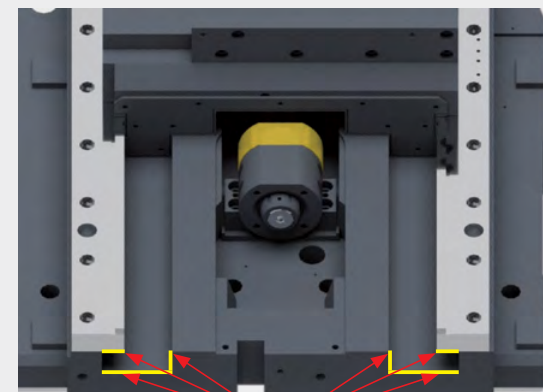
Pre-tensioned double anchored travel axis



Pre-tensioned double anchored travel axis

All travel axes employ pre-tensioned double anchored ball screws to minimize thermal growth and are supported on both ends using high precision P4 angular bearings for high precision operation

- Pre-tensioned double anchored (minimize thermal growth)
- High precision angular bearing+large diameter high precision ball screws



Hexahedral Slide Way Frame

6 contact surface slideway frame (X-axes)

The wide guideway surfaces and contact surface slideways are heat treated and precision ground to maintain high precision, heavy duty cutting capability over its lifetime

High rigidity design



High rigidity 45-degree slant bed
to support heavy-duty cutting

The 45-degree slant bed with torque tube rib structure offers superb twisting and bending resistance during heavy duty cutting, enabling high precision machining.

Also, the slant bed allows for easier access to the workpiece and superb chip discharge

Easy chip removal

The 45-degree slant bed design allows for convenient chip removal and easy access for tool changes and inspections

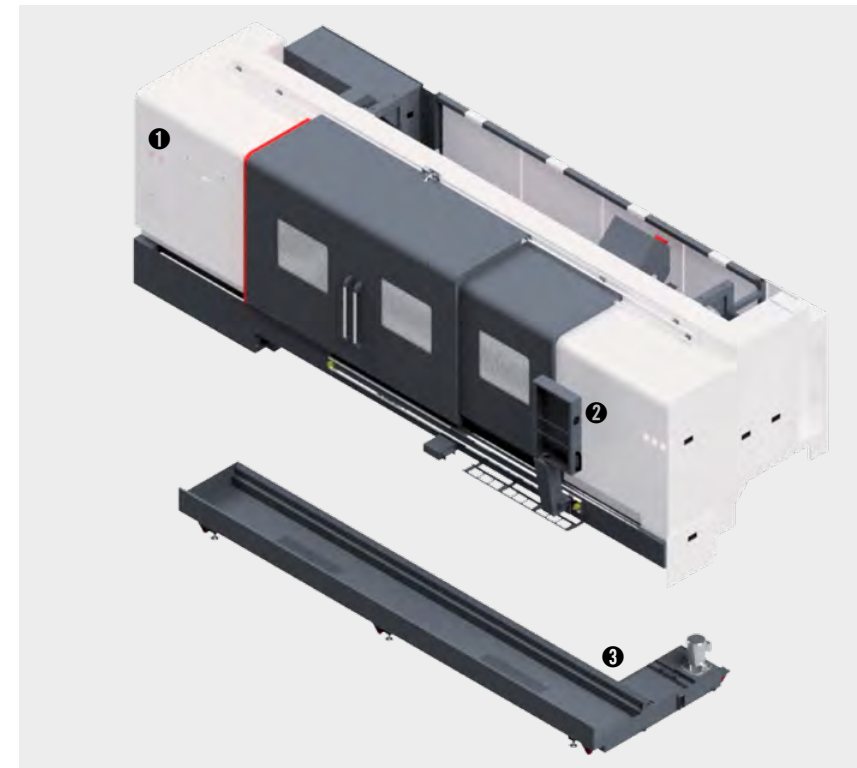
Programmable tailstock (standard)

The programmable tailstock allows for the tailstock and the quill to be operated via M-CODE and maintains high precision during heavy-duty cutting

Tailstock Quill Stroke : **150mm(5.91inch)**

Tailstock Taper : **MT5**

Ease of use



① Easy hydraulic valve adjustment

The gauge and hydraulic valves are located at a height that make it easy for the operator to adjust

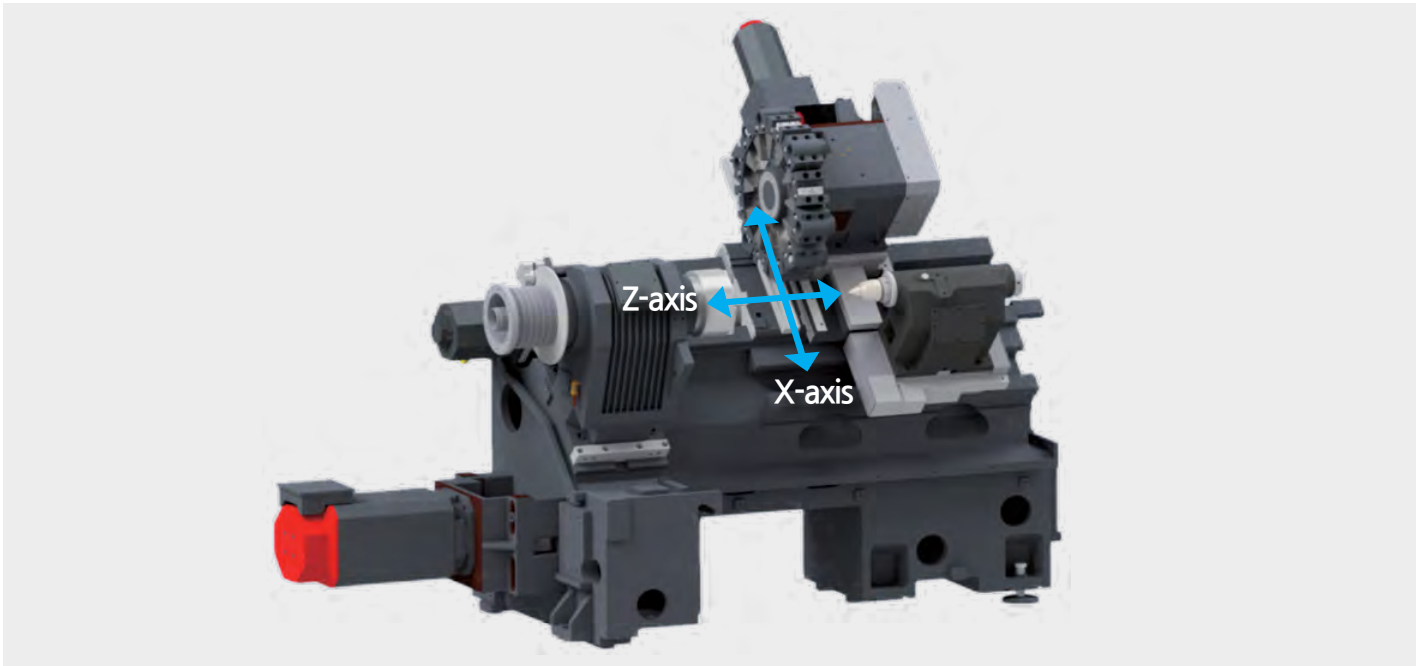
② User-centric 15" Large Screen OP Panel

The QWERTY-type keyboard and high visibility buttons and effective button placement enhances ease of use

③ Easy coolant tank maintenance

When cleaning the coolant tank, the coolant tank may be removed while leaving the chip conveyor attached to the machine, making it easier to clean and maintain

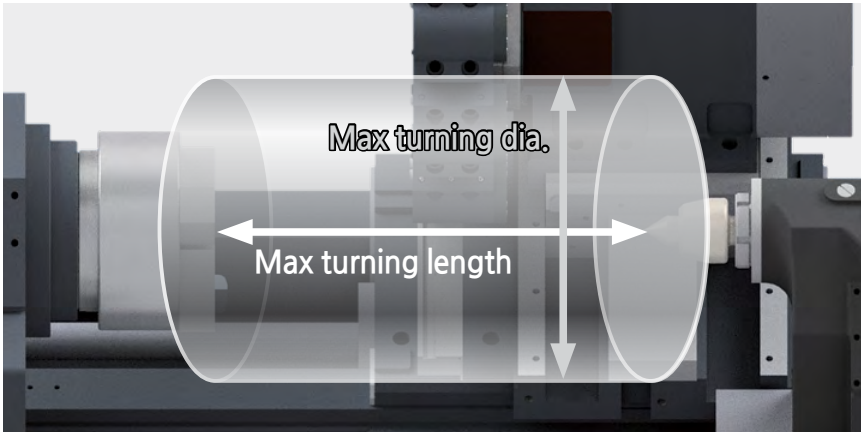
Machine Design



Model	Travel [mm<inch>]		Rapid Traverse [m/min<ipm>]	
	X-axis	Z-axis	X-axis	Z-axis
SL 4000X/XM	340<13.39>	2,170<85.43>	16<629.92>	20<787.40>
SL 4000L/LM	340<13.39>	3,170<124.90>	16<629.92>	20<787.40>

All travel axes are comprised of high rigidity box guideways enabling heavy duty cutting and superb productivity

Work Range



Providing a large work envelope, ensuring cost effective productivity

Model	Max turning dia [mm<inch>]	Max turning length [mm<inch>]
SL 4000AX AXM	630 560<24.80 22.05>	2,128 2,084<83.78 82.05>
SL 4000BX BXM	630 560<24.80 22.05>	2,087 2,042<82.17 80.39>
SL 4000AL ALM	630 560<24.80 22.05>	3,128 3,084<123.15 121.42>
SL 4000BL BLM	630 560<24.80 22.05>	3,087 3,042<121.54 119.76>

Spindle



Model	Chuck size	Speed rpm	Power (Cont./Max) [kW<Hp>]	Torque (Cont./Max) [N·m<lbs.ft>]
SL 4000AX (AXM) /AL (ALM)	12"	2,500	18.5/26<24.81/34.87>	1,651/2,320<1,217.72/1,711.15>
SL 4000BX (BXM) /BL (BLM)	15"	2,000	18.5/26<24.81/34.87>	1,651/2,320<1,217.72/1,711.15>

The high power motor allows both high precision and high torque machining, improving operator productivity.

SL 4000 Series

Max speed (A/B Type)
2,500/2,000rpm

Power (cont/max)
18.5/26kW
(24.81/34.87 Hp)

Torque (cont/max)
1,651/2,320N·m
(1,217.72/1,711.15 lbs.ft)

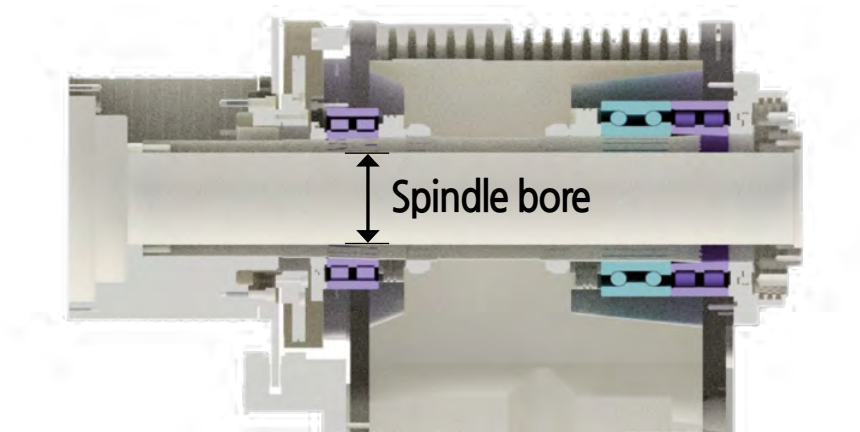
SL 4000 Series_Mill Motor

Max speed
4,000rpm

Power (cont/max)
5.5/7.5kW
(7.38/10.06 Hp)

Torque (cont/max)
35/47.7N·m
(25.82/35.19 lbs.ft)

The Double Row of high precision Cylindrical Roller Bearings and Angular Ball Bearings on the spindle front end and the Double Row of Cylindrical Roller Bearings in the spindle rear ensures high speed, high precision turning



Model	Spindle bore [mm<inch>]	Spindle nose (ASA)
SL 4000AX (AXM) /BX (BXM)	Ø115(132)<4.53(5.20)>	A2-11
SL 4000AL (ALM) /BL (BLM)	Ø115(132)<4.53(5.20)>	A2-11

Turret



Servo turret

Turret indexing employs an internally developed method of Non Stop Random Index that uses a high powered Servo Index Motor to allow 0.25 second single station turret indexing.

And the 3-piece Curvic Coupling significantly increases the clamping force and indexing accuracy

Turret indexing time : **0.25**sec
No. of tool positions : **12**ea (□32×32, Ø60)
(□1.26"×1.26", Ø2.36")



BMT Milling Turret

This 12 tool position (BMT75) turret with the largest in class curvic coupling and powerful hydraulic clamping force is capable of accepting a rotary tool in every tool position and allows a variety of machining operations with a single set-up

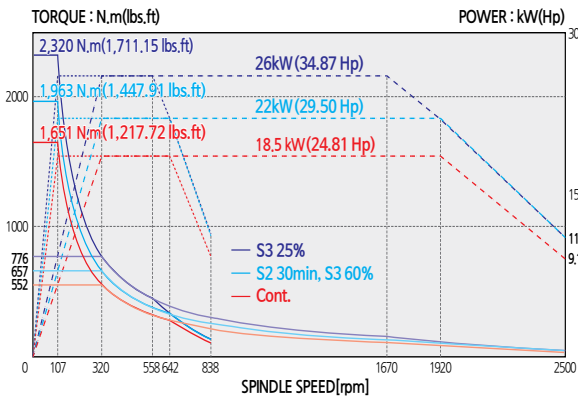
The best in class BMT75 tool holders ensure high rigidity, high precision machining and the non-stop turret indexing in either direction minimizes the turret index time down to 0.25 seconds per station.

Turret indexing time : **0.25**sec
No. of tool positions : **12**ea (□32×32, Ø60)
(□1.26"×1.26", Ø2.36")

Power torque diagram

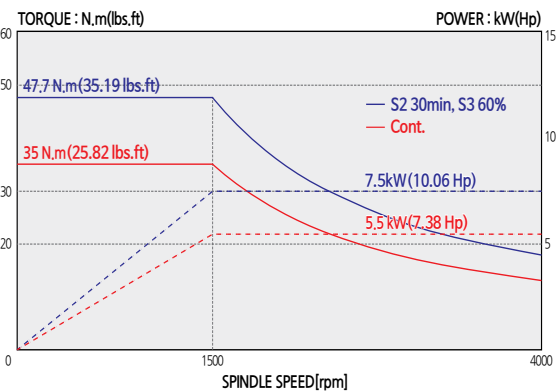
SL 4000X/L

Max. speed(A/B Type) : **2,500/2,000**rpm
Power (cont/max) : **18.5/26**kW (24.81/34.87 Hp)
Torque (cont/max) : **1,651/2,320**N·m
(1,217.72/1,711.15 lbs.ft)



SL 4000XM/LM Milling Motor Torque Diagram

Max. speed : **4,000**rpm
Power (cont/15min) : **5.5/7.5**kW (7.38/10.06 Hp)
Torque (cont/15min): **35/47.7**N·m
(25.82/35.19 lbs.ft)



Accessories [Optional]

Oil skimmer

Continuously cleans the coolant by removing waste oils

Air blow

Used to automatically remove chips from the chuck after machining and used for safe loading of the chuck in an automated line.

Steady rest

Provides additional stability when cutting long parts and the size of the steady rest may be selected

Tool presetter

Provides faster and more precise tool setup, checking for tool wear and compensation

Chip conveyor

Used to discharge chips created during machining

Cutting Performance

Test conditions : SL 4500ALM, S45C

O.D Cutting

	mm (inch)	
Cutting dia.	327 (1.29)	
Cutting depth	9 (0.36)	
Cutting speed	132 (5,196.86)	
Spindle speed	330	
Feedrate	0.4 (0.016)	
Chip removal rate	1,296 (43.83)	

Endmill

	mm (inch)	
Endmill dia.	25 (0.99)	
Cutting depth	5 (0.20)	
Cutting speed	220 (8,661.42)	
Spindle speed	2,800	
Feedrate	1,008 (39.69)	
Chip removal rate	126 (4.27)	

Tap

	mm	
Tap size	M24	
Cutting depth	45 (1.78)	
Cutting speed	20 (787.41)	
Spindle speed	265	
Feedrate	3 (0.12)	

U-Drill Cutting

	mm (inch)	
U-drill dia.	Ø63 (2.49)	
Cutting speed	200 (7,874.02)	
Spindle speed	1,011	
Feedrate	0.34 (0.014)	
Chip removal rate	1,070 (36.19)	

※ The above data is based on internal testing. Values may change depending on cutting conditions.

❖ SMEC FANUC i series



- 15" LCD color display
- High quality designed OP Panel
- Conversational programming, Manual Guide i
- Part program size 2MB
- SMEC Custom S/W

SMEC Custom S/W displayed using MDI's **S1** button or OP Panel's **CUSTOM** button

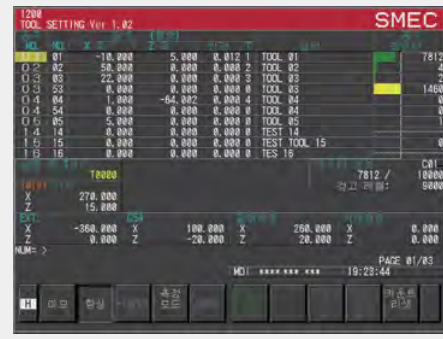
❖ **CUSTOM** : Provide operator convenience and improve productivity using the support function for tool management and additional device setting.



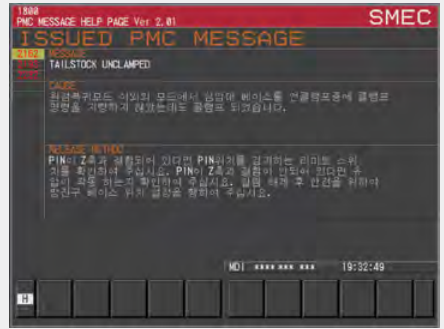
M/G-Code check function
Allows the operator to directly read the M/G-Code on the machine for easy application programming



Easy tailstock setting
Easily configure a variety of functions such as travel limiting, origin setting and signal check



Display only the necessary tools and offsets and check the configured counter at the same time
Tool information and setting management mode



PMC alarm check function
When a PMC alarm occurs, the cause and countermeasures are described in detail, making operation and maintenance more convenient



Counter for each T-Code

❖ Manual Guide i (STD)

SMEC's Manual Guide i system enables advanced part program creation and more efficient and faster machining with conversational programming



Check cutting result using cutting simulation



Check cutting path using cutting simulation

Easy program creation and editing

Program creation using advanced part program editing and extensive cutting cycles

Check program using cutting simulations

Program pre-check using realistic cutting simulation

Effective cutting setup

Tool and cutting condition offset data setup based on measurement cycle

Advanced cutting capabilities

Check cutting status such as cutting cycle name and tool icon during the cutting process

Measurement

Feedback of cutting results and tool offset values after cutting

❖ IoT Solution (OPT)



NC-Gate / IoT-Gate

The NC-Gate / IoT-Gate that was developed in-house with our ICT technology is a universal gateway that not only interworks with our machine tools, but machine tools from other manufacturers, robots, automation equipment, and analog / digital sensors as a network device capable of bi-directional communication.

Supported drivers : Fanuc / Mitsubishi / Siemens NC, Modbus TCP, DeviceNet, Profibus, Ethernet, AI/DI/DO



Provides key performance indicators and displays target achievement

- Indicators : achievement rate, productivity, process defect rate, equipment and factory usage, quality defect rate, lead time, and average cycle time



Provides figures and graphs of overall equipment effectiveness

- Availability, performance, quality, etc.



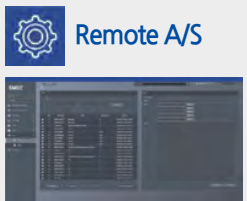
Provides operation status and alarm information in case of problems in the production line

- Provides information about the operation status, speed, production alarms, etc. of each machine



Remote control and operation

- Emergency stop switch, program editing, etc.



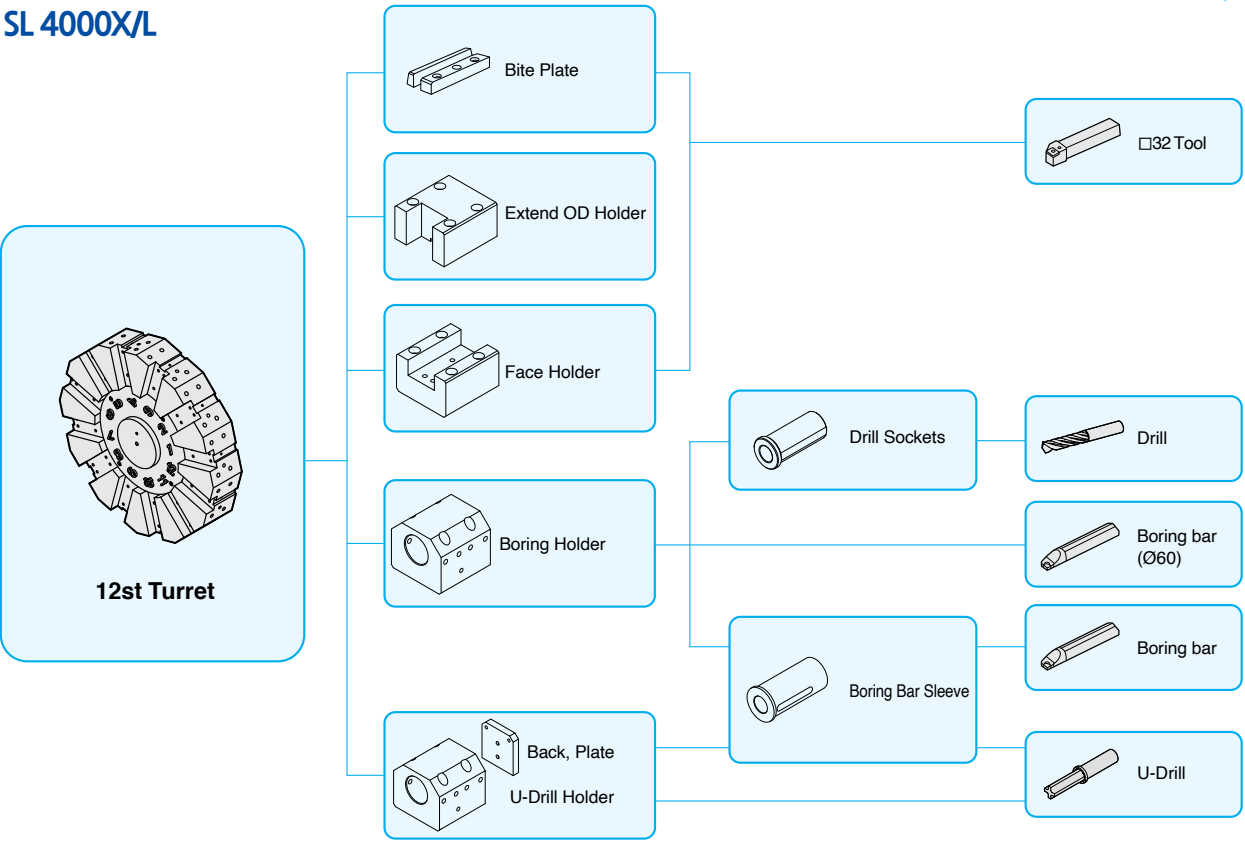
Problem diagnosis via remote control

- Provide remote diagnosis services to users via the IIoT solution

Tooling System

SL 4000X/L

Unit : mm(inch)



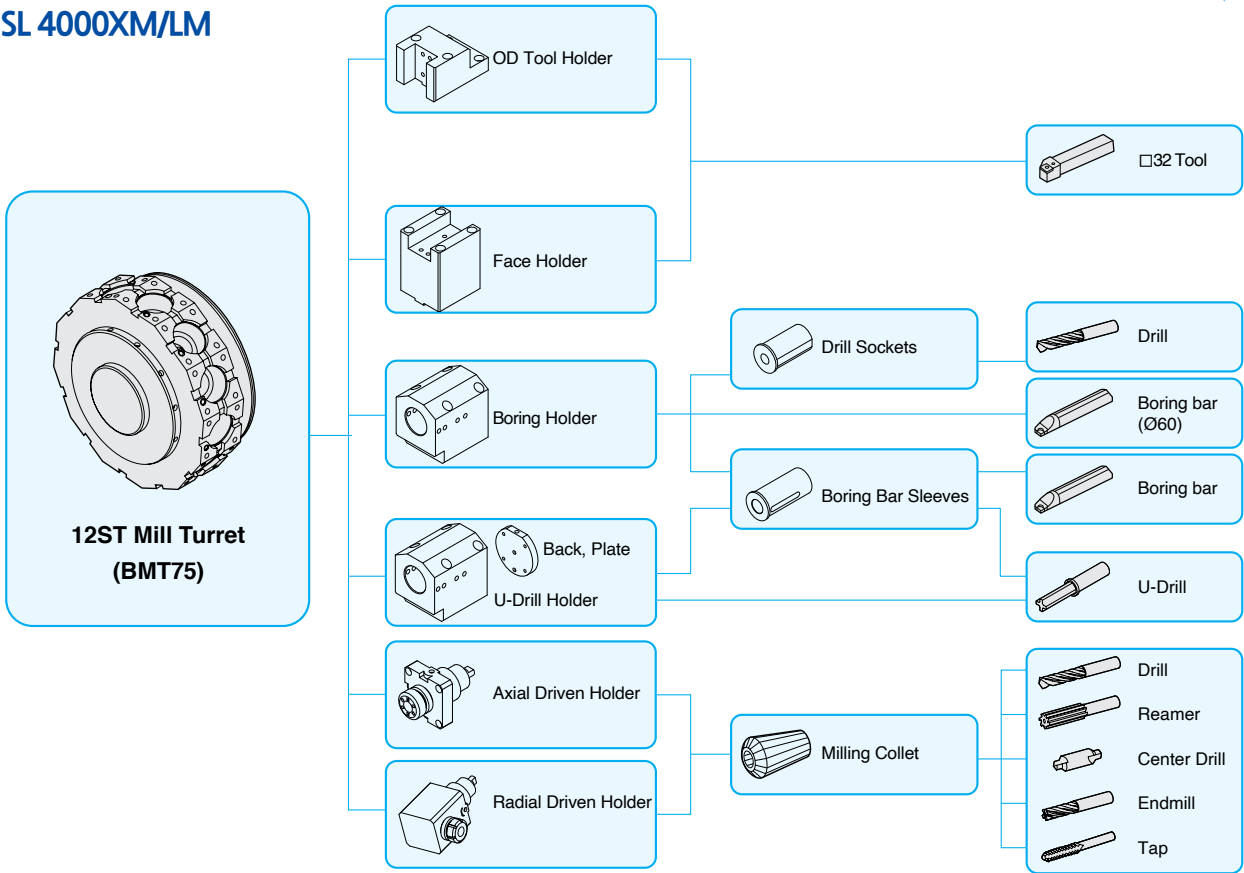
Standard Tooling

Item / Description			SL 4000X/L
Turning Holder	OD HOLDER	-	1
	Facing Holder	-	1
Boring Holder	BORING HOLDER	-	3
	U-Drill Holder	-	2
Driven Holder	AXIAL DRIVEN HOLDER	-	-
	RADIAL DRIVEN HOLDER	-	-
Socket	Boring	Ø12 (Ø1/2")	1
		Ø16 (Ø5/8")	1
		Ø20 (Ø3/4")	1
		Ø25 (Ø1")	1
		Ø32 (Ø1 1/4")	1
		Ø40 (Ø1 1/2")	1
		Ø50 (Ø2")	1
	Drill	MT 2	1
		MT 3	1
		MT 4	1
		MT 5	1

Tooling System

SL 4000XM/LM

Unit : mm(inch)



Standard Tooling

Item / Description			SL 4000XM/LM
Turning Holder	OD HOLDER	-	4
	Facing Holder	-	1
Boring Holder	BORING HOLDER	-	2
	U-Drill Holder	-	1
Driven Holder	AXIAL DRIVEN HOLDER	-	2
	RADIAL DRIVEN HOLDER	-	2
Socket	Boring	Ø12 (Ø1/2")	1
		Ø16 (Ø5/8")	1
		Ø20 (Ø3/4")	1
		Ø25 (Ø1")	1
		Ø32 (Ø1 1/4")	1
		Ø40 (Ø1 1/2")	1
		Ø50 (Ø2")	1
	Drill	MT 2	1
		MT 3	1
		MT 4	1
		MT 5	1

HORIZONTAL TURNING CENTER

Work Range

Unit : mm (inch)

SL 4000X/L

O.D Tool

Technical drawing of the SL 4000X/L O.D Tool. The tool is shown in a side view with a central cutting edge. Dimensions are provided in millimeters (mm) and inches (inch). The overall length is 2,170 mm (85.43/124.81) ST. The tool has a main body diameter of Ø315 (12") and a cutting edge diameter of Ø381 (15"). The cutting edge length is 144 mm (5.67). The tool has a tailstock section with a length of 128 mm (5.04). The main body has a length of 166.5 mm (6.56) and a tailstock section with a length of 150 mm (5.91). The tool has a total length of 2,030 mm (79.92/119.30) ST. The tool has a main body diameter of Ø315 (12") and a cutting edge diameter of Ø381 (15"). The cutting edge length is 144 mm (5.67). The tool has a tailstock section with a length of 128 mm (5.04). The main body has a length of 166.5 mm (6.56) and a tailstock section with a length of 150 mm (5.91). The tool has a total length of 2,030 mm (79.92/119.30) ST.

I.D Tool

Technical drawing of the SL 4000X/L I.D Tool. The tool is shown in a side view with a central cutting edge. Dimensions are provided in millimeters (mm) and inches (inch). The overall length is 2,170 mm (85.43/124.81) ST. The tool has a main body diameter of Ø315 (12") and a cutting edge diameter of Ø381 (15"). The cutting edge length is 114 mm (4.49). The tool has a tailstock section with a length of 145 mm (5.71). The main body has a length of 166.5 mm (6.56) and a tailstock section with a length of 150 mm (5.91). The tool has a total length of 2,030 mm (79.92/119.30) ST. The tool has a main body diameter of Ø315 (12") and a cutting edge diameter of Ø381 (15"). The cutting edge length is 114 mm (4.49). The tool has a tailstock section with a length of 145 mm (5.71). The main body has a length of 166.5 mm (6.56) and a tailstock section with a length of 150 mm (5.91). The tool has a total length of 2,030 mm (79.92/119.30) ST.

SL 4000XM/LM

O.D Tool

Technical drawing of the SL 4000XM/LM O.D Tool. The tool is shown in a side view with a central cutting edge. Dimensions are provided in millimeters (mm) and inches (inch). The overall length is 2,170 mm (85.43/124.81) ST. The tool has a main body diameter of Ø315 (12") and a cutting edge diameter of Ø381 (15"). The cutting edge length is 132 mm (5.20). The tool has a tailstock section with a length of 120 mm (4.73). The main body has a length of 166.5 mm (6.56) and a tailstock section with a length of 150 mm (5.91). The tool has a total length of 2,030 mm (79.92/119.30) ST. The tool has a main body diameter of Ø315 (12") and a cutting edge diameter of Ø381 (15"). The cutting edge length is 132 mm (5.20). The tool has a tailstock section with a length of 120 mm (4.73). The main body has a length of 166.5 mm (6.56) and a tailstock section with a length of 150 mm (5.91). The tool has a total length of 2,030 mm (79.92/119.30) ST.

I.D Tool

Technical drawing of the SL 4000XM/LM I.D Tool. The tool is shown in a side view with a central cutting edge. Dimensions are provided in millimeters (mm) and inches (inch). The overall length is 2,170 mm (85.43/124.81) ST. The tool has a main body diameter of Ø315 (12") and a cutting edge diameter of Ø381 (15"). The cutting edge length is 132 mm (5.20). The tool has a tailstock section with a length of 145 mm (5.71). The main body has a length of 166.5 mm (6.56) and a tailstock section with a length of 150 mm (5.91). The tool has a total length of 2,030 mm (79.92/119.30) ST. The tool has a main body diameter of Ø315 (12") and a cutting edge diameter of Ø381 (15"). The cutting edge length is 132 mm (5.20). The tool has a tailstock section with a length of 145 mm (5.71). The main body has a length of 166.5 mm (6.56) and a tailstock section with a length of 150 mm (5.91). The tool has a total length of 2,030 mm (79.92/119.30) ST.

Standard / Optional				● : Standard ○ : Optional △ : Discuss X : N/A						
Category			SL 4000X/L	SL 4000XM/LM	Category			SL 4000X/L	SL 4000XM/LM	
Spindle	3 jaw open-center chuck		●	●	Chip Disposal	Chip conveyor (Hinge / Scraper)	Side	○	○	
	Soft jaw (3set)		●	●			Rear	X	X	
	Hard jaw (1set)		○	○		Special chip conveyor (drum filter)		△	△	
	Chuck clamp footswitch		●	●		Chip bucket	Fixed 380L	○	○	
	Dual pressure chucking		○	○			Rotate 275L	○	○	
	C-axis control (0.001°)		X	○	3 step patrol lamp and buzzer		●	●		
	Chuck clamp confirmation		●	●	Lamp for electrical cabinet		X	X		
	Chuck dual footswitch		○	○	Remote MPG		X	X		
Turret	Tool holder		●	●	Electrical	Work counter		Digital	△	△
	Rotary holder type	BMT	X	●		Total counter		Digital	△	△
	Rotary holder (axial)		X	●		Tool counter		Digital	△	△
	Rotary holder (radial)		X	●		Multi counter	6EA	△	△	
	Boring bar sleeve (same as U-drill holder sleeve)		●	●			9EA	△	△	
	Drill socket		●	●		Grounded circuit breaker		△	△	
	U-drill holder		●	●		AVR(Auto Voltage Regulator)		X	X	
						Transformer		○	○	
Tailstock	Programmable tailstock		●	●		Auto Power Off		○	○	
	Quill forward/reverse confirmation		○	○		Measurement	Tool Presetter	Manual	○	○
	Tailstock footswitch		○	○	Auto			○	○	
Coolant & Air Blow	Coolant above chuck		○	○	Linear scale		X-axis	○	○	
	Coolant gun		○	○			Z-axis	○	○	
	Air blower (above chuck)		○	○	Coolant level gauge (requires chip conveyor)		○	○		
	Rotary tool holder TSC		○	○	Environmental	Air conditioner for electrical cabinet		○	○	
	Air gun		○	○		Dehumidifier		△	△	
	Coolant pump	4.5Bar	●	●		Oil mist collector		○	○	
		7Bar	○	○		Oil skimmer		○	○	
		10Bar	○	○	Automation	Auto door		○	○	
		14.5Bar	○	○		Sub controller		△	△	
		20Bar	○	○		Barfeeder interface		△	△	
Coolant chiller		○	○	Additional M-codes (4 pairs)		△	△			
				Automation interface		△	△			
				I/O expansion (including both IN and OUT)		16 contacts	△	△		
					32 contacts	△	△			

※ : For detailed information, please contact your local SMEC dealer.

SL 4000 Series

HORIZONTAL TURNING CENTER

Machine Specifications

[] : Option

DESCRIPTION			SL 4000X/XM		SL 4000L/LM	
			A type	B type	A type	B type
Chuck	Chuck size	inch	12"[15"]	15"[18"]	12"[15"]	15"[18"]
Capacity	Swing over bed	mm(inch)	770(30.31)		770(30.31)	
	Swing over cross-slide	mm(inch)	615(24.21)		615(24.21)	
	Max turning diameter	mm(inch)	630 560(24.80 22.05)		630 560(24.80 22.05)	
	Max turning length	mm(inch)	2,128 2,084 (83.78 82.05)	2,087 2,042 (82.17 80.39)	3,128 3,084 (123.15 121.42)	3,087 3,042 (121.54 119.76)
Spindle	Spindle speed	rpm	2,500	2,000	2,500	2,000
	Spindle nose	ASA	A2-11		A2-11	
	Draw tube ID	mm(inch)	103(4.06)	117.5(4.63)	103(4.06)	117.5(4.63)
	Spindle bore	mm(inch)	115(4.53)	132(5.20)	115(4.53)	132(5.20)
	Main spindle motor (cont/max)	kW(Hp)	18.5/26(24.81/34.87)		18.5/26(24.81/34.87)	
Travels	X-axis stroke	mm(inch)	340(13.39)		340(13.39)	
	Z-axis stroke	mm(inch)	2,170(85.43)		3,170(124.80)	
	X-axis rapid traverse	m/ min(ipm)	16(629.92)		16(629.92)	
	Z-axis rapid traverse	m/ min(ipm)	20(787.40)		20(787.40)	
Turret	No of tool positions	ea	12 12<BMT 75>		12 12<BMT 75>	
	OD tool size	mm(inch)	32(1.26)		32(1.26)	
	Boring bar diameter	mm(inch)	60(2.36)		60(2.36)	
	Indexing time	sec	0.25		0.25	
	Rotary tool speed	rpm	- 4,000		- 4,000	
	Rotary tool motor (cont/max)	kW(Hp)	- 5.5/7.5(7.38/10.06)		- 5.5/7.5(7.38/10.06)	
Tailstock	Quill diameter	mm(inch)	160(6.30)		160(6.30)	
	Quill stroke	mm(inch)	150(5.91)		150(5.91)	
	Quill taper	MT	MT5(Built-in)		MT5(Built-in)	
Machine	Size <with SIDE chip conveyor> L×W×H	mm(inch)	5,360(6,435)×2,085×2,305 (211.02<253.35>×82.09×90.75)		6,360(7,371)×2,267×2,212 (250.39<290.20>×89.25×90.75)	
	Size <with REAR chip conveyor> L×W×H	mm(inch)	-		-	
	Weight	kg(lb)	9,400 9,500 (20,723.45 20,943.91)	9,500 9,600 (20,943.91 21,164.38)	11,400 11,500 (25,132.70 25,353.16)	11,500 11,600 (25,353.16 25,573.62)
	Coolant tank capacity	Liter(gal)	255(67.36)		313(82.69)	
Electric power supply			kVA/V		41/220	
Controller			FANUC 0i-TF+			

※ Design and specifications are subject to change without notice.

NC Specification / FANUC

● : STD ○ : Optional X : N/A

Category		0i-TF+	Category		0i-TF+
Controlled axis	Controlled axes	X, Z, Y, C	Program input	Absolute / incremental command	G90/G91
	Max simultaneously controlled axes	4		Repeating canned cycle	●
	Least input increment	0.001mm / 0.0001"		Repeating canned cycle 2	●
	Built-in stroke limit	Soft overtravel 1, 2, 3		Canned cycles	●
	Machine lock	●		Drilling canned cycle	●
Operation functions	Manual handle feed	X1, X10, X100		Decimal point input	●
	Dry run	●		Inch / metric conversion	G20 / G21
	Single block	●		Program restart	●
	Feed per minute	G94		Sub program call	●
	Feed per revolution	G95		Max programmable value	±99999.999mm/±9999.9999"
	DNC operation	Ethernet, CF card		M function	3 digit
	Thread cutting pause	○		Custom macro	●
Interpolation functions	Linear interpolation	G01		Addition of custom macro common variables	#100~#199, #500~#999
	Circular interpolation	G02, G03		Direct drawing dimension programming	●
	Dwell	G04		Programmable data input	G10
	Cylindrical interpolation	G70.1		Tape code	ISO / EIA
	Skip	G31		Optional block skip	●
	Nano smoothing	X		Workpiece coordinate system	G52 ~ G59
	Polar coordinate interpolation	●		Addition of workpiece coordinate system	X
	Reference position (zero) return	G28	Interface function	Embedded ethernet	●
	Reference position (zero) return check	G27		Fast ethernet	X
	2nd, 3rd, 4th reference point return	G30	Setting and display	Alarm and operator history display	●
	Variable lead thread cutting	●		Run hour and parts count display	●
	Thread repair	●		Loadmeter display	●
	Feed function	Rapid traverse override		F0, 25%, 50%, 100%	Self diagnosis function
Feedrate override		0~200%		Extended part program editing	●
Jog override		●		Machining condition selection function	○
AI look ahead		X		Machining quality level adjustment	X
AI contour control II		○ (200 block)		Display screen	15" color LCD
Spindle function	Spindle orientation	●		Multi-language display	25 language
	Rigid tapping	M29	Data input/output	Fast data server	X
	Spindle override	S0 ~ 150%		RS232C interface	●
	Arbitrary speed threading	○		Memory card input / output	●
Tool functions	Tool number command	T4-Digt Tool number		USB memory input / output	●
	Tool nose radius compensation	G40 ~ G42	Editing operation	Part program storage size	512Kbyte
	Tool offset pairs	128-pairs		Number of registered programs	400(1,000) EA
	Tool geometry / wear offset	●		Manual guide 0i	○
	Tool length compensation	●		Manual guide i	●
	Tool life management	●			
	Tool path graphic display	●			