

NC Specifications / FOi-TF

Item		Specification	Item		Specification
Controlled axis	Controlled axes	X,Z,C	Program input	Tool length offset	○
	Max. simultaneously controlled axes	4		Tool life management	○
	Least command increment	0.001mm / 0.0001"		Tool path graphic display	○
	Stored stroke check	Soft overtravel 1, 2, 3	Program input	Absolute/incremental programming	G90/G91
	Machine lock	○		Multiple repetitive cycle	○
Operation functions	Pulse handle feed	X1, X10, X100		Multiple repetitive cycle II	○
	Dry run	○		Canned cycles	○
	Single block	○		Canned cycle for drilling	○
	Feedrate per minute	G94		Decimal point programming	○
	Feedrate per revolution	G95		Inch/metric conversion	G20 / G21
	DNC operation	Ethernet, CF card		Program restart	○
Retraction for rigid tapping	OPT	Sub program call		○	
Interpolation functions	Linear interpolation	G01		Program input	Max. programmable dimension
	Circular interpolation	G02, G03	M function		3 digit
	Dwell	G04	Custom macro		○
	Cylindrical interpolation	G70.1	Addition of custom macro common variables		#100~#199, #500~#999
	Skip	G31	Direct drawing dimension programming		○
	Nano smoothing	-	Programmable data input		G10
	Polar coordinate interpolation	○	Tape code		ISO / EIA
	Reference position return	G28	Optional block skip		○
	Reference position return check	G27	Workpiece coordinate system		G52 ~ G59
	2nd/3rd/4th reference position return	G30	Addition of workpiece coordinate system		-
	Variable lead thread cutting	○	Interface function	Embedded ethernet	○
	Thread Repair	Manual guide i		Fast ethernet	-
	Feed function	Rapid traverse rate override	F0, 25%, 50%, 100%	Setting and display	Alarm & Operator histor display
Feedrate override		0~150%	Run hour and parts count display		○
Jog Override		○	Display spindle & servo overload		○
AI advanced preview control		-	Self-diagnosis function		○
AI contour control II		OPT(200 block)	Extended part program editing		○
Preview block number increase		-	Machining condition selecting function		OPT
High-speed processing		-	Machining quality level adjustment		-
Look-ahead blocks expansion		-	Display screen	10.4" color LCD	
Smooth tolerance Control		-	Multi-language display	25 language	
Spindle function	Spindle orientation	○	Data input/output	Fast data server	-
	Rigid tapping	M29		RS232C interface	○
	Spindle override	50 ~ 150%		Memory card input/output	○
	Arbitrary speed threading	OPT		USB memory input/output	○
Program input	Tool number command	T4-Digt Tool number	Editing operation	Part program storage size	512Kbyte(2Mbyte)
	Tool nose radius compensation	G40 ~ G42		Number of registerable programs	400(1,000) EA
	Tool offset pairs	128-pairs		Manual guide Oi	OPT
	Tool geometry/wear offset	○		Manual guide i	OPT

SMEC

PL 1600 Series

CNC TURNING CENTER



SMEC
SMEC CO.,LTD.

SMEC Co., Ltd.
157-10, Goldenroot-ro, Juchon-myeon,
Gimhae-si, Gyeongsangnam-do, Korea
Tel +82 55 340 4800
Fax +82 55 340 4740



SMEC
Smart One,
Global One

SMEC
SMEC CO.,LTD.

- 1988 - Started as Samsung Heavy Industries Machine Tools Business
- 1989 - Horizontal and vertical machining center technology partnership with OKK Japan
- 1991 - Turning center and vertical machining center technology partnership with Mori Seiki
- 1996 - 5-sided processing center technology partnership with Toshiba
- 1999 - Spun out from Samsung Aerospace Industries and established SMEC Co., Ltd

SMEC

Company

Engineering

Machine Tools

Samsung

PL 1600 series

PL 1600A/1600B/1600AM/1600BM

Strongest in class with superb structural design
Simultaneous heavy duty and precision turning

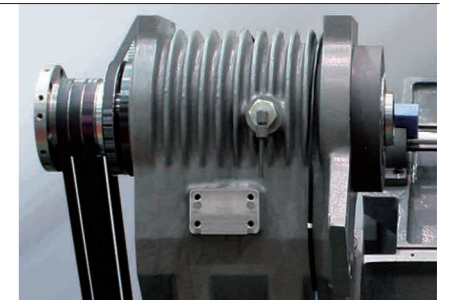
- 45 degree torque tube type bed to support heavy duty turning
- Significantly reduced non-cutting time and efficient turning
- Low-center of gravity reducing vibration, thermal deformation and improving rigidity

High Accuracy, High Rigidity Spindle

Pin Tube Rib Design for Minimal Axis Heat Transfer

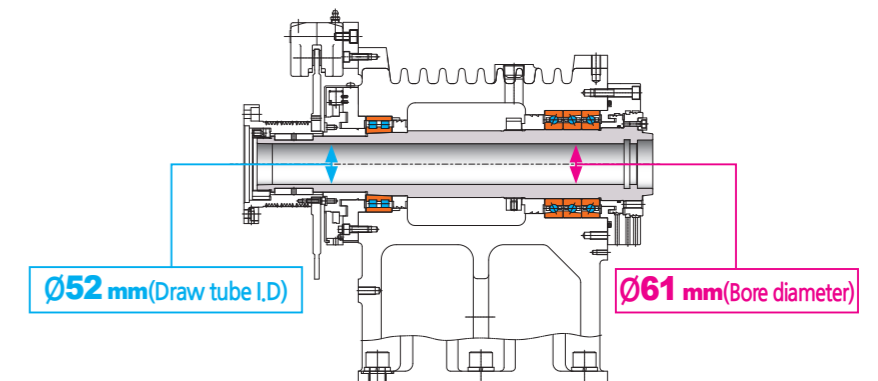
Radiator fan-like pin tube rib design dissipates heat, maintaining minimal thermal expansion.

3 sets of precision angular contact ball bearings are located in the front of the spindle, and a double row of cylindrical roller bearing is located in the rear to ensure high speed cutting capabilities with precision.

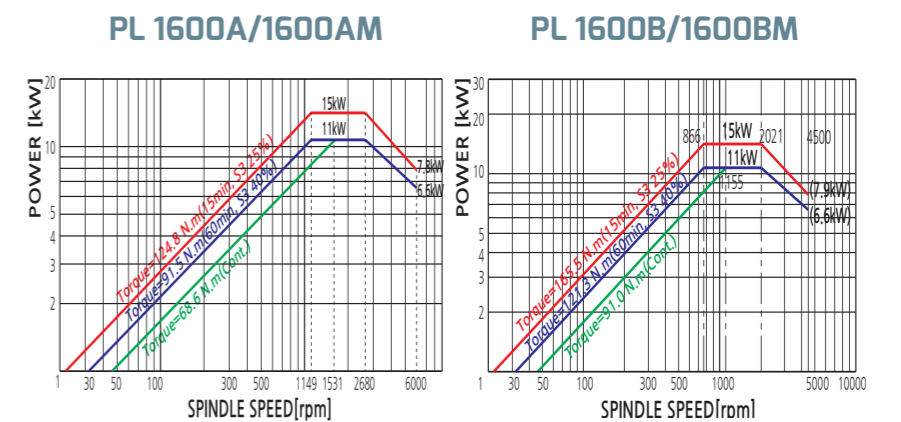


SPINDLE & HEADSTOCK

The Spindle and Headstock are machined and ground in a temperature controlled environment and assembled in a clean room.



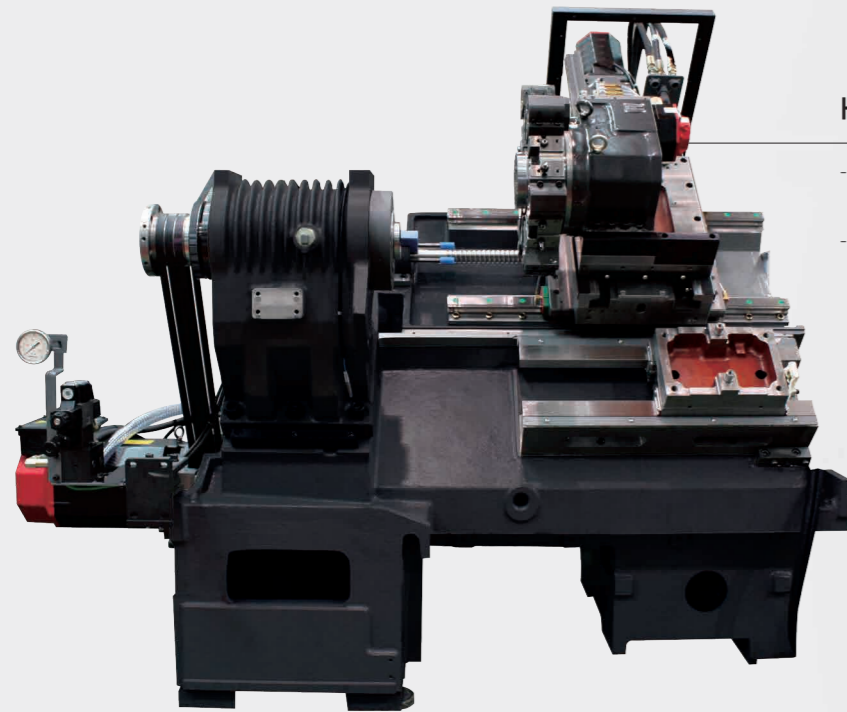
Spindle Power & Torque Diagram



PL 1600A/1600B/1600AM/1600BM a compact, ultra precision Turning Center, combined with SMEC's advanced technological features.

Highly Reliable and Rigid Structural Design

- One piece Meehanite casting with heavily ribbed torque tube design
- Rigid bed supports for powerful cutting
- Excellent vibration dampening and thermal displacement design

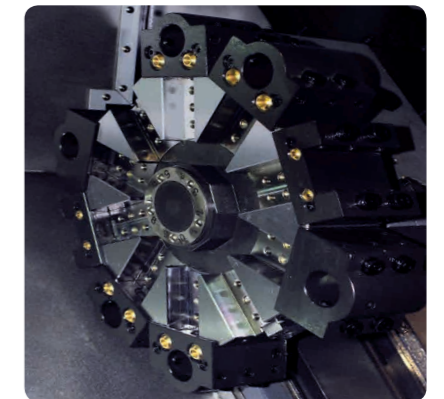
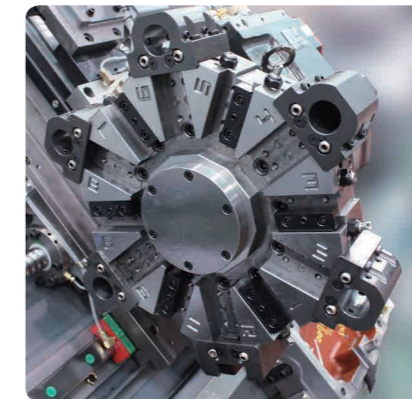


Description	PL 1600A	PL 1600AM	PL 1600B	PL 1600BM
Max. machining length	mm 307	291	270.5	261.6
X/Z axis travel	mm	165/350		
X/Z rapid traverse rate	m/min	24/30		
Chuck size	inch	6		8
Spindle Speed	rpm	6,000		4,500
Motor(cont./30min)	kW	11/15		11/15



PL 1600A (High Speed Servo Turret)

PL 1600B (High Speed Servo Turret)



Indexing Time
0.2sec at 60Hz 12stations

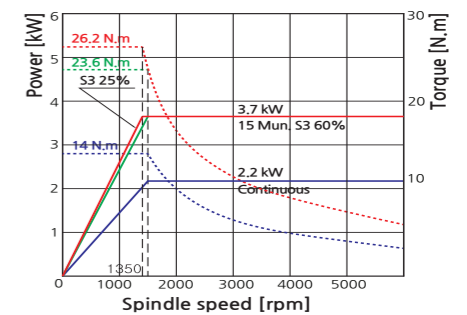
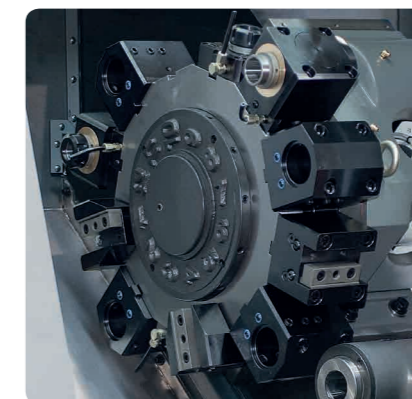
Indexing Time
0.2sec at 60Hz 10stations

High Speed, Heavy Duty Hyd. Index Turret

Driven by a high torque hydraulic index motor, the 10 or 12-station heavy-duty turret can accept tools on both left and right side of each station. Turret indexing (repeatability ± 0.005) is non-stop, bi-directional with a fast 0.2 second next station index time. A large diameter (Ø130) Curvic coupling with 3,300kgf clamping force enables precision as well as heavy-duty cutting.

PL 1600A (High Speed Servo Turret)

Milling Motor Torque Diagram



Indexing Time
0.15sec at 60Hz 12stations

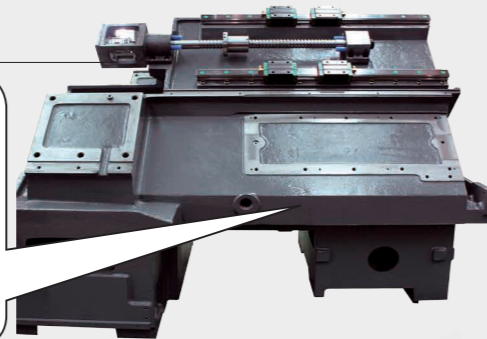
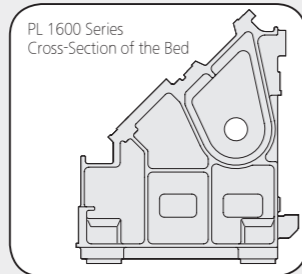
BMT Milling Turret (M Type)

PL 1600AM/1600BM are equipped with standard 12-station BMT turret capable of accepting rotary tools at any station, providing flexible machining thru various machining operations in just one set-up. Each BMT holder is securely tightened by 4 screws, allowing the turret to perform heavy-duty cutting, milling and drilling operations. Turret indexing is non-stop, bi-directional with a fast 0.15 second next station index time.

Rigid 45 degree Slant Bed

45 degree slant torque tube design bed and wide guide slide way ensure long term rigidity and machining accuracy.

Featuring superior workability and chip-discharging capability, the bed is designed in a single tube structure boasting strong durability even in heavy-duty cutting.

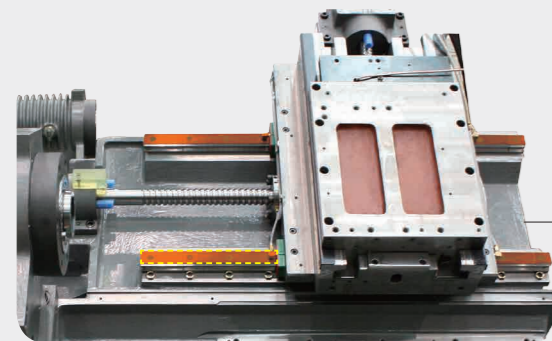
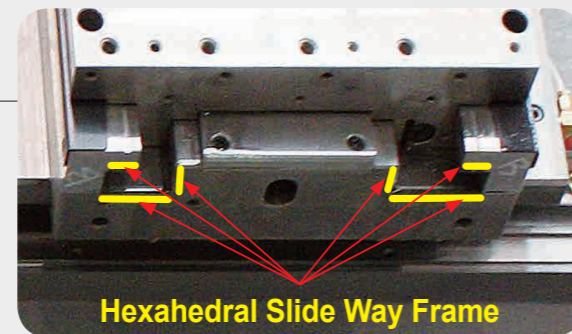


Highly reliable Lubrication unit

Highly reliable LUBE unit discharges the right amount of lubrication oil to each guide way automatically.

Hexahedral Slide Way Frame (X-axis)

Wide integral way is machined from casting, induction hardened and precision ground to ensure long-term rigidity, machining accuracy and heavy-duty machining.

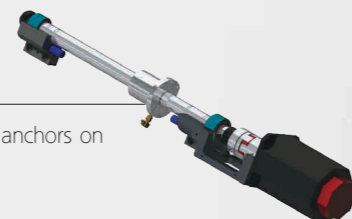


Linear Slide Way Frame (Z-axis)

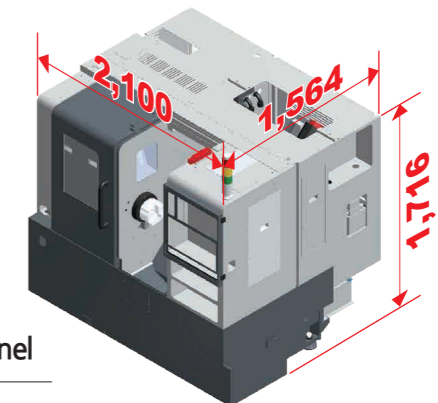
Sustained by high-rigidity Linear Guide to realize high-speed and precision machining.

Pre-tensioned and Double Anchored Ballscrews

All axes ballscrews are pre-tensioned, heat treated, and fixed by double anchors on both ends, providing ultimate rigidity and minimal thermal growth.

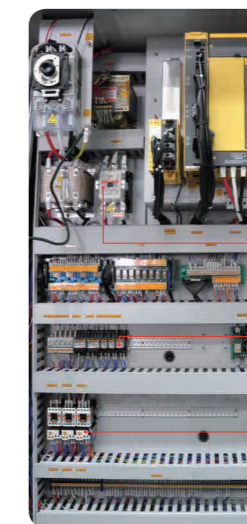


Compact design for easy automation



User friendly centralized control panel

1. Solid BEZEL for maintaining the original form of control panel
2. High-reliability of Fuji products(Cycle Start, Feed Hold, Power On/Off, key S/W)
3. Preventing to erase the name of the buttons with transparent cap (cap changable)
4. High-intensity LED lamp
5. Manual turret control and tool No display
6. Serve control panel for additional options
7. Swivel control panel for user friendly



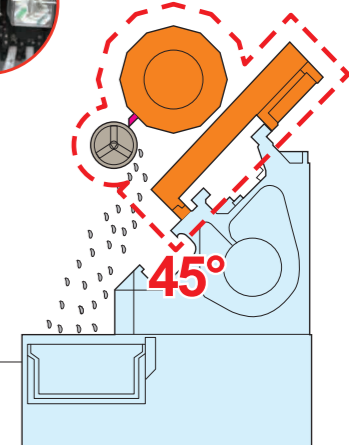
Electric Cabinet Made with Highly Reliable Components

- Magnet switch, Circuit breaker, Key S/W(FUJI)
- Relay(WEIDMULLER, OMRON)



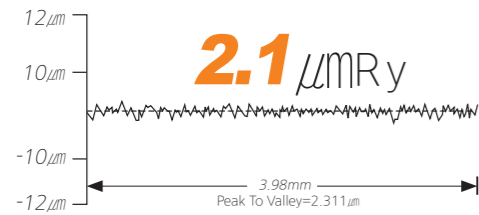
Easy chip disposal

45 degree slant bed to achieve easy chip disposal and tool inspection as well as tool change



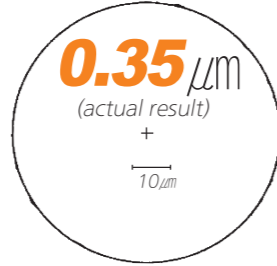
High Precision

Surface Roughness



Model : PL 1600A(Material : SM 45C, O.D Cutting)

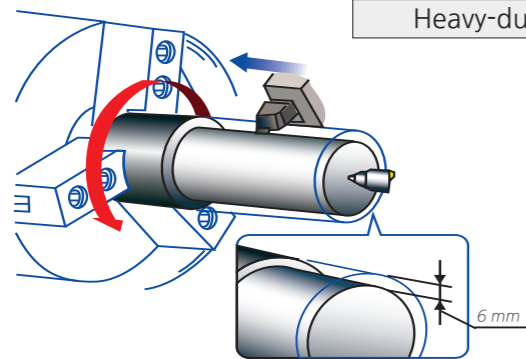
Roughness



Cutting condition	
Tool	Diamond tool <nose radius 0.020 inch>
Material	AL150<Aluminum>
Cutting speed	230 m/min
Feedrate	0.05 mm/rev
Depth of cut	0.1 mm
Outer diameter	200 mm
Filter	1-50

Processing Speed

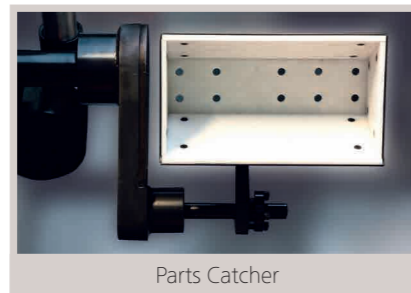
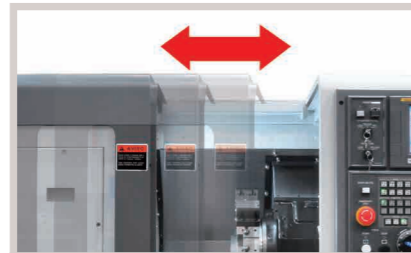
Turning Performance (material:SM45C) PL 1600A



Heavy-duty cutting (O.D) <20mm×20mm qualified tool>

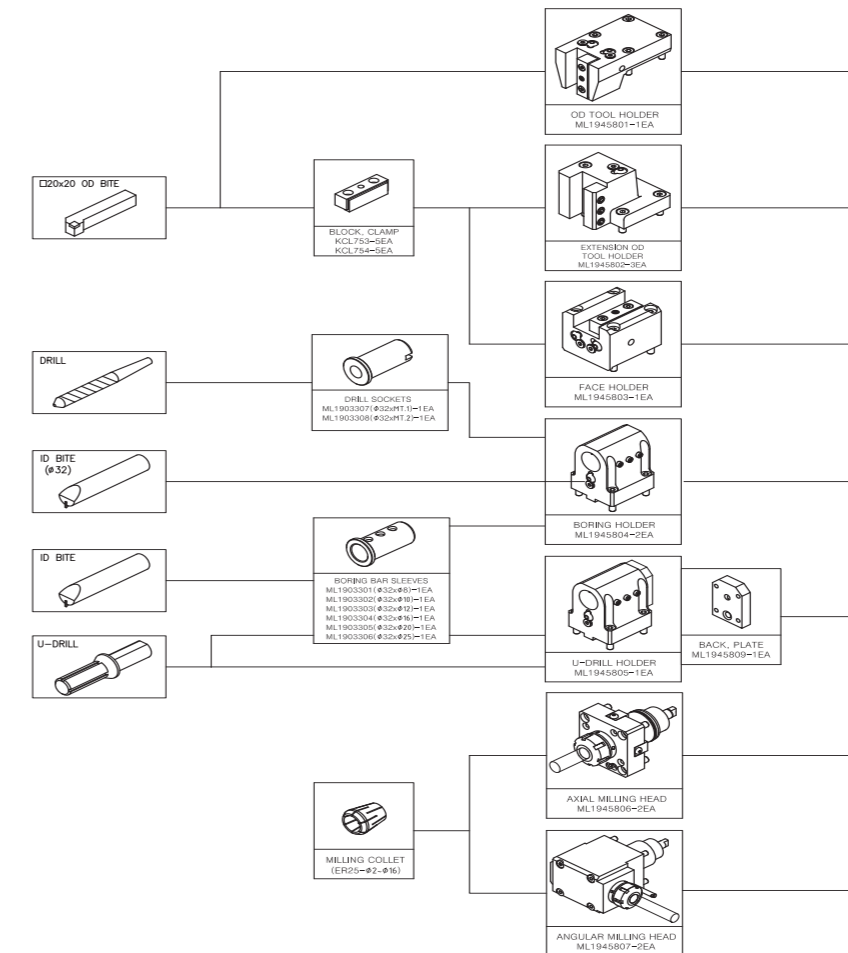
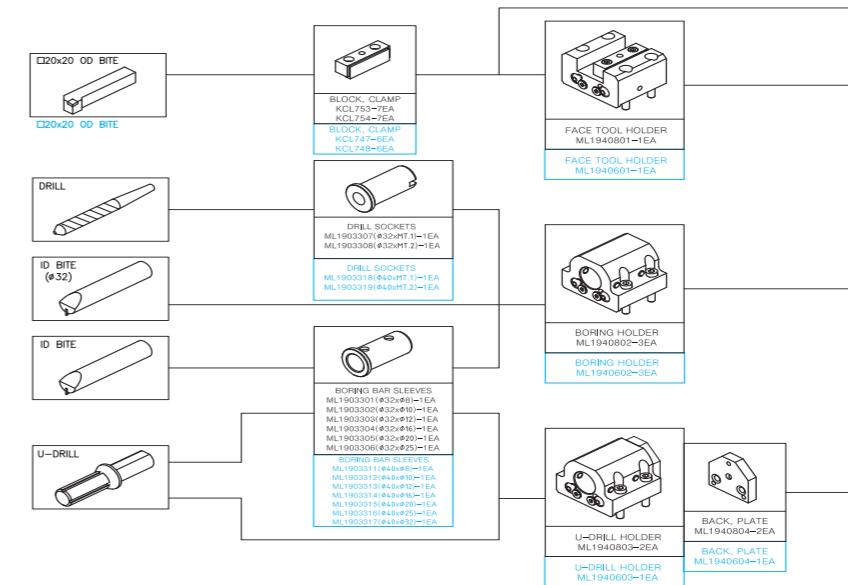
Spindle speed
868 rpm
Cutting speed
120 m/min (383 fpm)
Depth of cut
6 mm <Spindle Load 50%>
Feedrate
0.3 mm/rev (0.08 ipr)

Optional Accessories



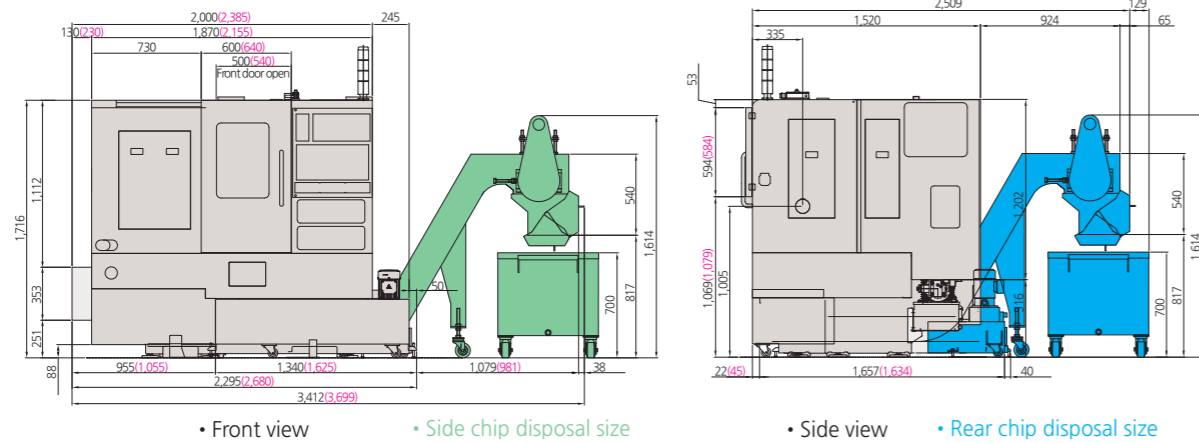
Tooling System

Unit : mm



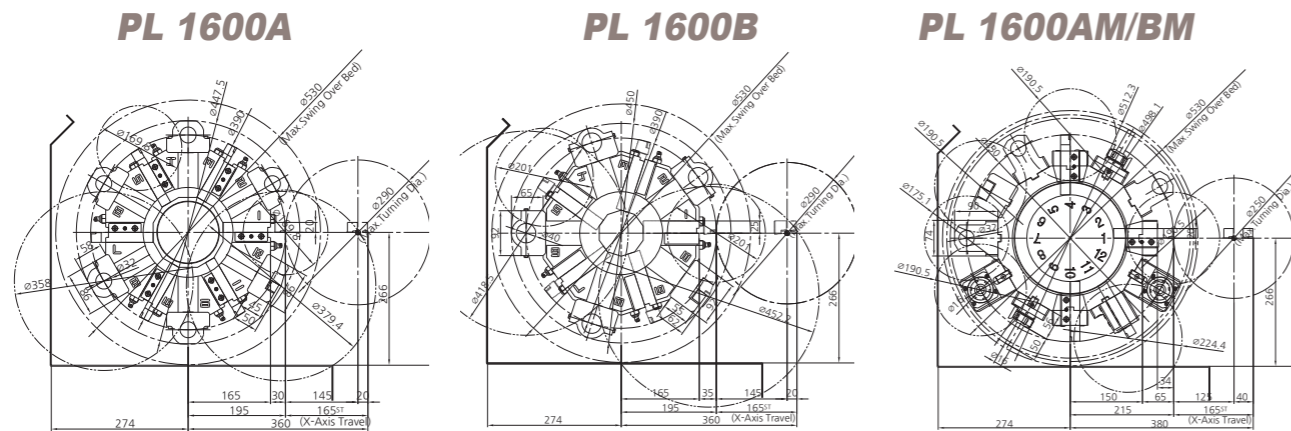
Machine Dimensions

◆ PL 1600A/1600B(1600AM/1600BM) Unit : mm



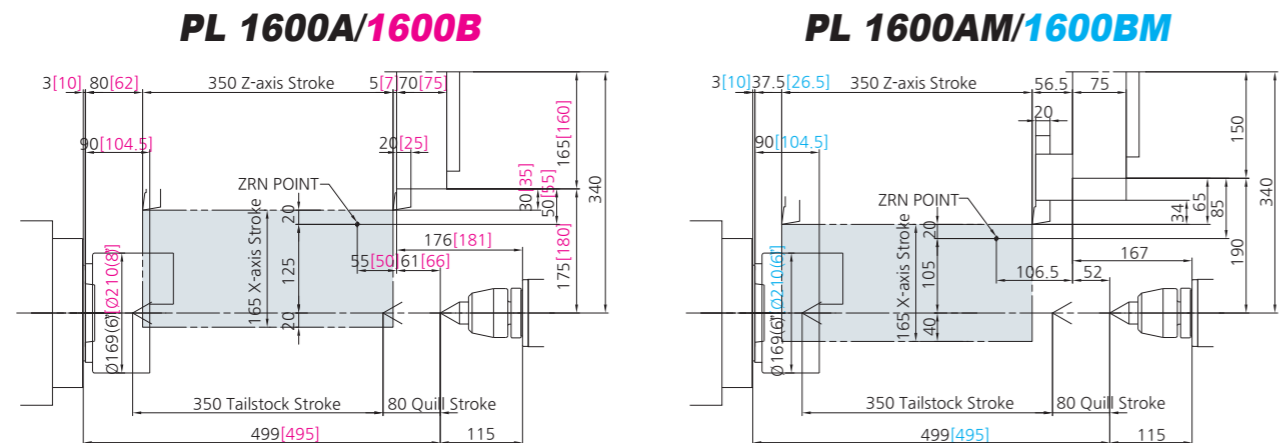
Turret Head Interference

Unit : mm



Work Range

Unit : mm



Major Specifications

DESCRIPTION	PL 1600		PL 1600M			
	A type	B type	A type	B type		
Chuck	Chuck size	inch	6"	8"	6"	8"
Capacity	Swing over bed	mm	530	530	530	530
	Swing over the cross slide	mm	290	290	290	290
	Max. machining diameter	mm	290	290	250	250
	Max. milling diameter	mm	-	-	268	268
Spindle	Max. machining length	mm	307	271	291	262
	Spindle Speed	rpm	6,000	4,500	6,000	4,500
	Spindle nose	ASA	A2-5	A2-6	A2-5	A2-6
	Draw tube ID	mm	52	52	52	52
Spindle	Spindle bore diameter	mm	61	61	61	61
	Motor (Cont./Max)	kW	11/15	11/15	11/15	11/15
Travels	X-axis travel	mm	165	165	165	165
	Z-axis travel	mm	350	350	350	350
	X-axis Rapid traverse rate	m/min	24	24	24	24
	Z-axis Rapid traverse rate	m/min	30	30	30	30
Turret	Number of tool stations	ea	12	10	12 (BMT45)	12 (BMT45)
	Turning tool shank size	mm	20	25	20	20
	Boring bar diameter	mm	32	32	32	32
	Indexing time	sec	0.20	0.20	0.15	0.15
	Rotary tool speed	rpm	-	-	5,000	5,000
	Rotary tool motor (Cont./Max)	kW	-	-	2.2/3.7	2.2/3.7
Tailstock	Quill diameter	mm	[65]	[65]	[65]	[65]
	Quill stroke	mm	[80]	[80]	[80]	[80]
	Spindle taper	MT	[MT4]	[MT4]	[MT4]	[MT4]
Machine	Size(with Side Chip conveyor) L×W×H	mm	2,395(3,494) × 1,760 × 2,071		2,680(3,661) × 1,760 × 2,071	
	Size(with Rear Chip conveyor) L×W×H	mm	2,170 × 1,966(2,677) × 2,071		2,385 × 1,966(2,677) × 2,071	
	weight	kg	2,850	2,940	3,100	3,190
	Coolant tank capacity	Liter	110	110	110	110
ELECTRIC POWER SUPPLY	kVA/V	31/220	31/220	31/220	31/220	
CONTROLLER		FANUC, SIEMENS				

*Figures in inches are converted from metric measurements.

[] : Option

Standard Accessories

- 6" hollow 3 jaws chuck (A Type)
- 8" hollow 3 jaws chuck (B Type)
- Chuck clamp confirmation
- Chuck clamp foot switch
- Chuck pressure switch
- Coolant system
- Door interlock
- Full splash guard with coolant tank
- Jaw (soft 3set, hard 1set)
- Leveling unit
- Manual/Part list (1set)
- Patrol lamp (3colors)
- Safety precaution name plate
- Spindle orientation
- Tool box
- Tool holders
- Work light (LED lamp)

Optional Accessories

- Air blower
- Air conditioners (electric cabinet)
- Air gun
- Auto door
- Auto shutter (top)
- Bar Feeder Interface
- Chip bucket
- Chip conveyor (side, rear)
- Coolant blower
- Coolant chiller
- Coolant gun
- Coolant level switch
- Counter (total, multi, tool, work)
- Oil mist collector
- Oil skimmer
- Part catcher
- Robot interface
- Special chuck
- Steady rest
- Tailstock (manual)
- Tool presetter (manual/auto)
- Transformer