

SAMSUNG Machine Tools

PL1600 Series CNC TURNING CENTER



■ NC Unit Specifications / FANUC Series				
Item		Specification	0i-Mate TD	0i-TD
Controlled axis	Max. feed axes		3 AXIS	4 AXIS
	Feed axes		X/Z/(Cs)	X/Z/(Cs)
	Max. simultaneously controlled axis		3	4
	Least command increment	0.001mm / 0.0001"	○	○
Operation functions	Pulse handle feed	X1, X10, X100	○	○
	Feedrate per minute	G98	○	○
	Feedrate per revolution	G99	○	○
Interpolation functions	Linear interpolation	G01	○	○
	Circular interpolation	G02, G03	○	○
	Dwell	G04	○	○
	Polar cordinate interpolation	G12.1, G13.1	○	○
	Cylindrical interpolation	G70.1	○	○
	Variable lead thread cutting	G34	○	○
	Continuous threading		○	○
	Reference position return	G28	○	○
	Reference position return check	G27	○	○
Feed function	Rapid traverse rate override	F0, 25%, 50%, 100%	○	○
	Feedrate override		0~150%	0~150%
Spindle function	Spindle orientation		○	○
	Rigid tapping		○	○
Tool functions	Tool number command	T4-Digt / T2-Digt	T4-Digt	T4-Digt
	Tool nose radius compensation	G40 ~ G42	○	○
	Tool offset pairs		○	○
	Tool geometry/wear offset	GEOMETRY & WEAR DATA	○	○
	Tool life management		○	○
	Tool path graphic display		○	○
	Automatic tool offset	G36, G37	-	○
	Direct input of tool offset value measured B		○	○
Program input	Absolute/incremental programming		○	○
	Multiple repetitive cycle	G70 ~ G76	○	○
	Canned cycles	G90, G92, G94	○	○
	Inch/metric conversion	G20 / G21	○	○
	Program restart		○	○
	Retraction for rigid tapping		○	○
	Max. programmable dimension	±99999.999mm/±9999.9999"	○	○
	M function	M3 digit	○	○
	Custom macro		○	○
	Canned cycle for drilling		○	○
	Direct drawing dimension programming		○	○
	Programmable data input	G10	○	○
	Optional block skip		○	○
	Workpiece coordinate system	G52 ~ G59	○	○
	Number of registerable programs		400EA	400EA
Setting and display	Alarm & Operator history display	ALARM & OPERATION DISPLAY	○	○
	Run hour and parts count display	RUNNING TIME & PART NO. DISPLAY	○	○
	Display spindle & servo overload	SPINDLE & SERVO LOAD DISPLAY	○	○
	Self-diagnosis function		○	○
	Extended part program editing	COPY, MOVE, CHANGE OF NC PROGRAM	○	○
	Display screen		8.4" color	8.4" color
Data input/output	Memory card input/output		○	○
	USB memory input/output		○	○
Editing operation	Part program storage size	512Kbyte(1280m)	○	○
Manual guide i	Manual Guide i		×	○



SAMSUNG'S Advanced Engineering and Machine Design

- Cast iron structure for superior dampening characteristics and thermal displacement
- Rigid 45 degree slant bed design for heavy-duty machining
- Torque tube design to minimize bending and twisting
- Hybrid slide way for long-term rigidity and heavy-duty machining

PL 1600 / 1600C
PL 1600M / 1600CM

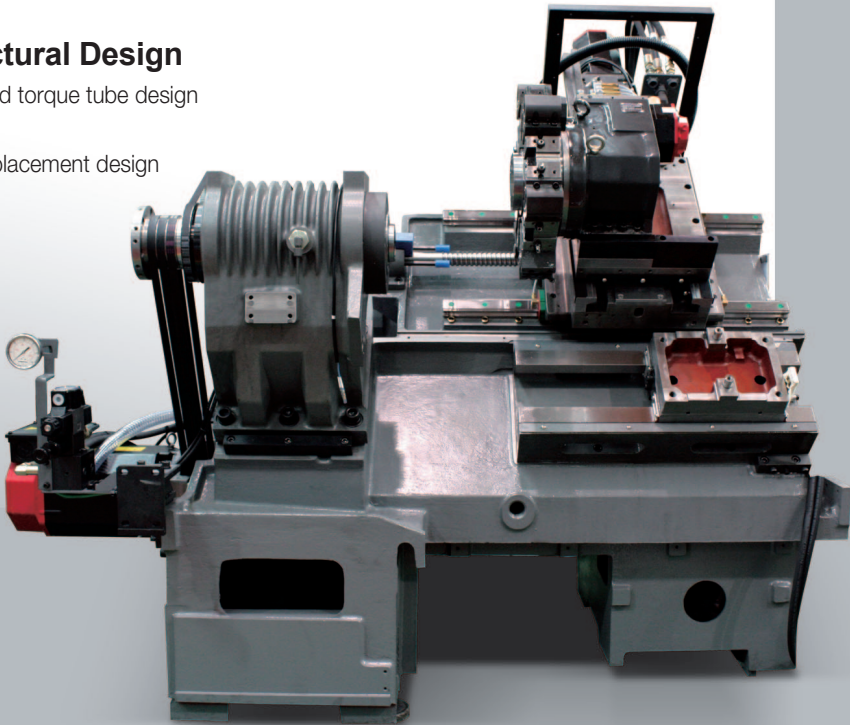


PL 1600/1600C/1600M/1600CM a compact, ultra precision Turning Center, combined with Samsung's advanced technological features.

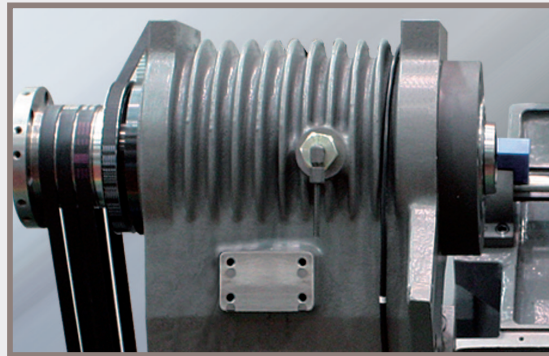
Description		PL 1600	PL 1600M	PL 1600C	PL 1600CM
Max. machining length	mm	307	291	270.5	261.6
X/Z axis travel	mm	165/350			
X/Z rapid traverse rate	m/min	24/30			
Chuck size	inch	6		8	
Spindle Speed	rpm	60 ~ 6,000		4,500	
Motor(30min/cont.)	kW	11/7.5		15/11	

■ 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



High Accuracy, High Rigidity Spindle

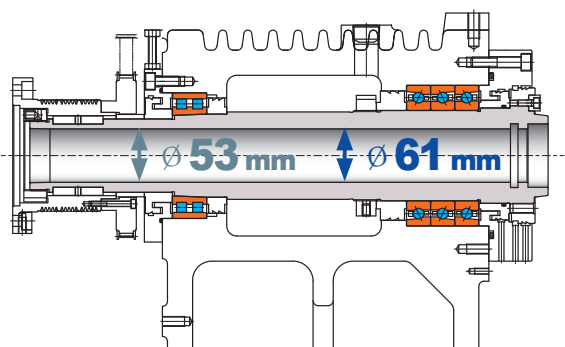


Pin Tube Rib Design for Minimal Axis Heat Transfer

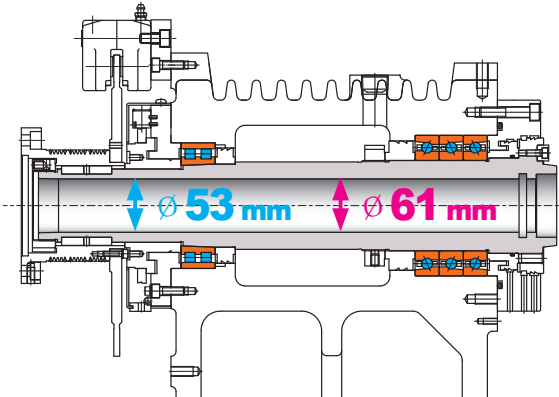
Radiator fan-like pin tube rib design dissipates heat, maintaining minimal thermal expansion.

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 PL 1600/1600C



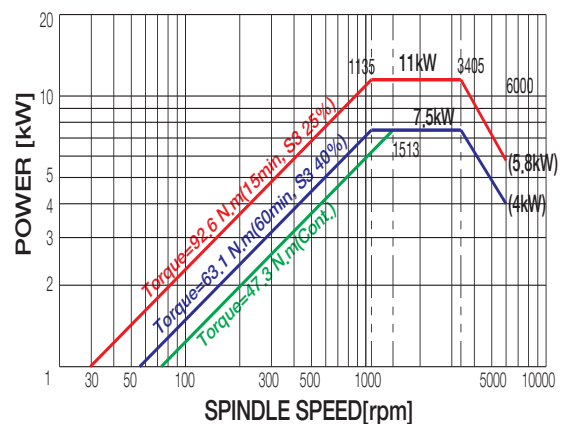
PL 1600M/1600CM



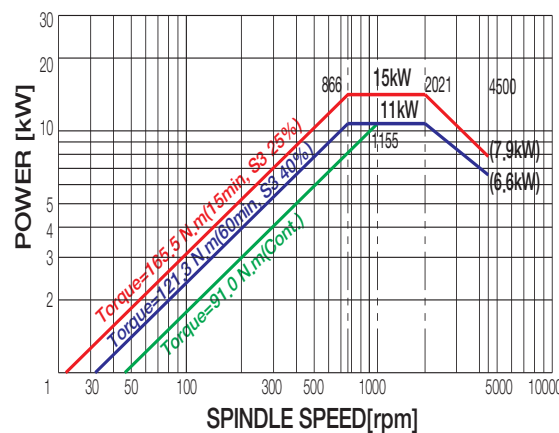
The Spindle and Headstock are machined and ground in a temperature controlled environment and assembled in a clean room.

Spindle Power & Torque Diagram

PL 1600/1600M

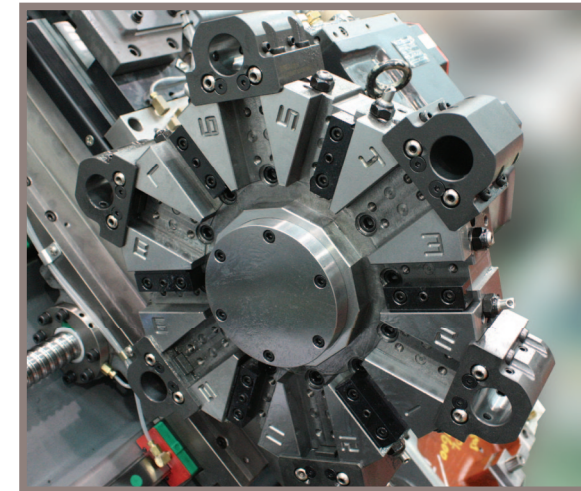


PL 1600C/1600CM



Machine Structure

PL 1600 (High Speed Servo Turret)



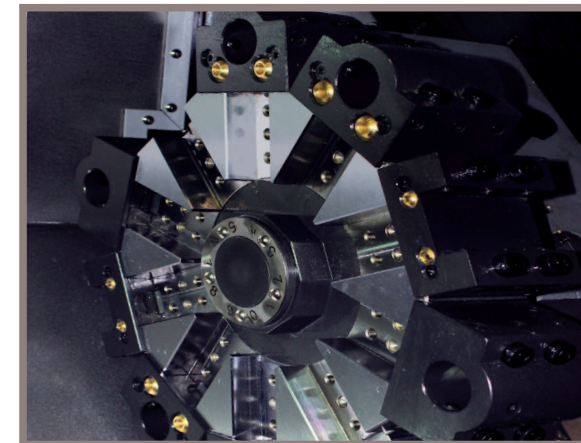
Indexing time

0.2 sec.

Number of tool positions

12 stations

PL 1600C (High Speed Servo Turret)



Indexing time

0.2 sec.

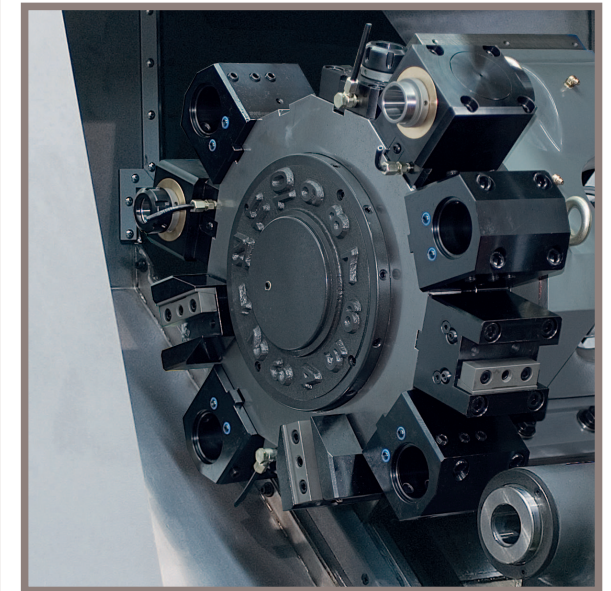
Number of tool positions

10 stations

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 ($\phi 130$) Curvic coupling with 3,300kgf clamping force enables precision as well as heavy-duty cutting.

PL 1600M/1600CM (High Speed Servo Turret)



Indexing time

0.2 sec.

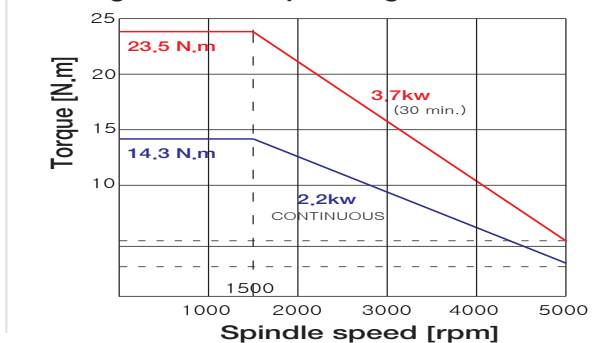
Number of tool positions

12 stations

BMT Milling Turret (M Type)

PL 1600M/1600CM 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 0.2 second next station index time.

Milling Motor Torque Diagram



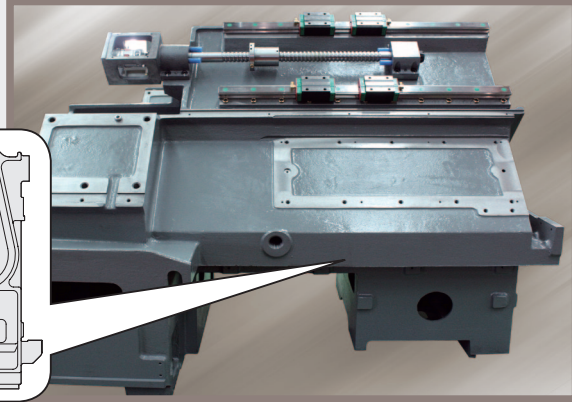
Machine Structure

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.

PL 1600 Series
Cross-Section of the Bed



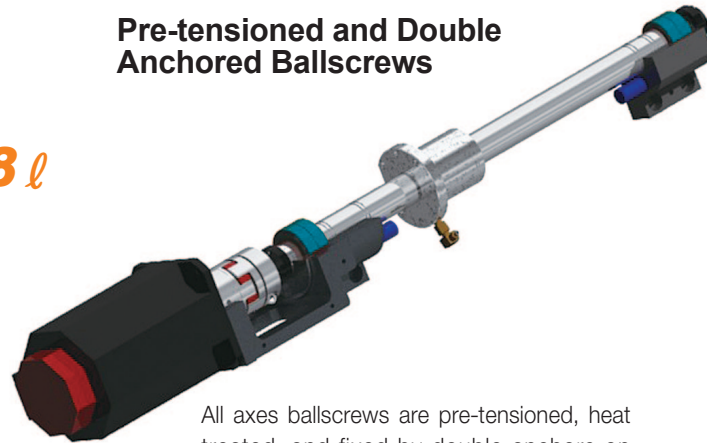
Highly reliable Lubrication unit

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

· MAKER : **Lube** · Capacity : **1.8 ℓ**



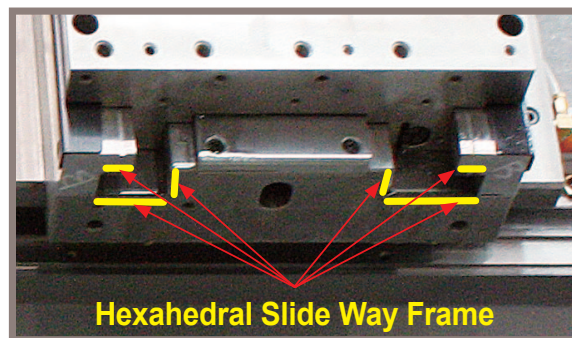
Pre-tensioned and Double Anchored Ballscrews



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

Hexahedral Slide Way Frame (X-axis)

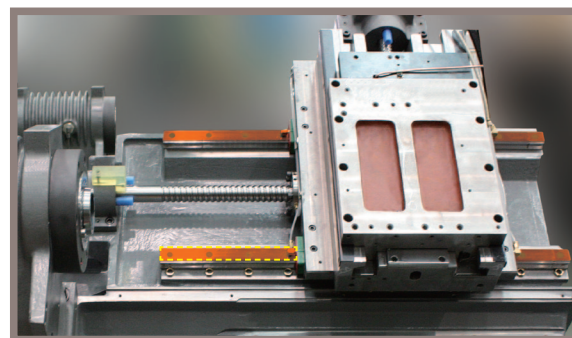
Wide integral way is machined from casting, induction hardened and precision ground to ensure long-term rigidity, machining accuracy and heavy-duty machining.



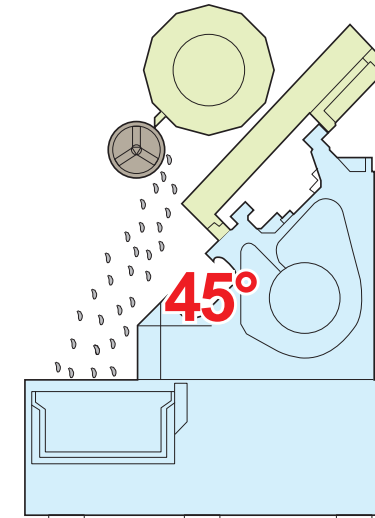
Hexahedral Slide Way Frame

Linear Slide Way Frame (Z-axis)

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

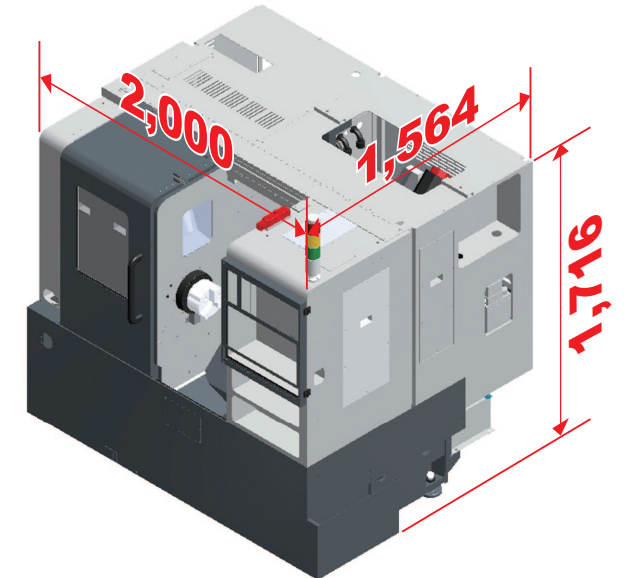


Machine Structure



Easy chip disposal

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



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

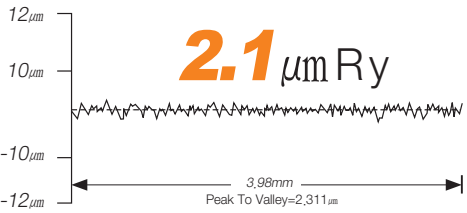


Electric Cabinet Made with Highly Reliable Components

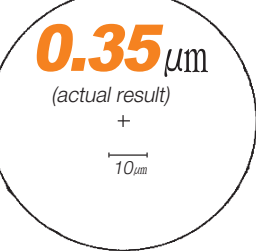
- Magnet switch, Circuit breaker, Key S/W(FUJI)
- Relay(WEIDMULLER, OMRON)

High Precision

Surface Roughness



Roundness

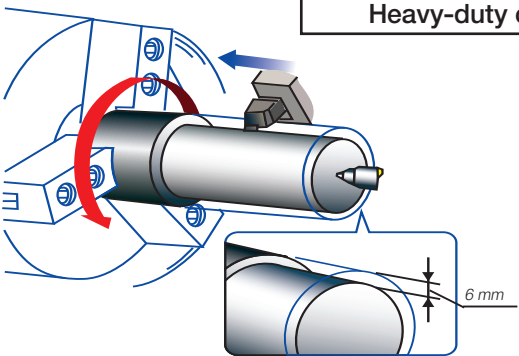


Cutting condition	
Tool	Diamond tool (nose radius 0.020 inch)
Material	AL150 (Aluminum)
Cutting speed	230 m/min
Feedrate	0.05 mm/rev
Depth of cut	0.1 mm
Outer diameter	200 mm
Filter	1-50

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

Processing Speed

Turning Performance (material:SM45C) PL 1600



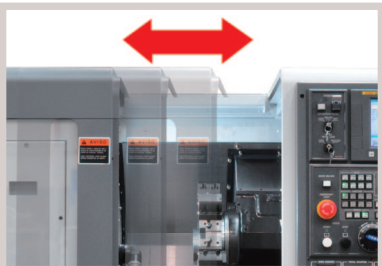
Heavy-duty cutting (O.D) <20mm x 20mm qualified tool>

Spindle speed
868 rpm
Cutting speed
120 m/min (393 fpm)
Depth of cut
6 mm <Spindle Load 50%>
Feedrate
0.3 mm/rev (0.08 ipr)

Optional Accessories



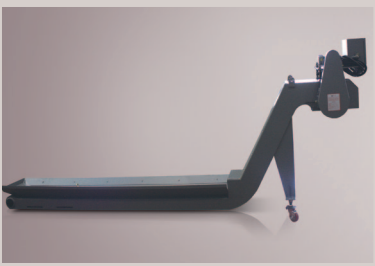
Tool Presetter



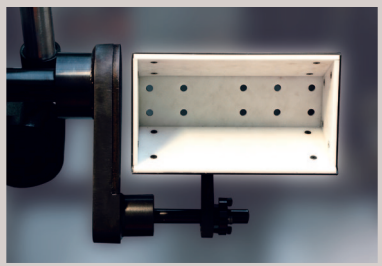
Auto Door



Tailstock



Chip Conveyor



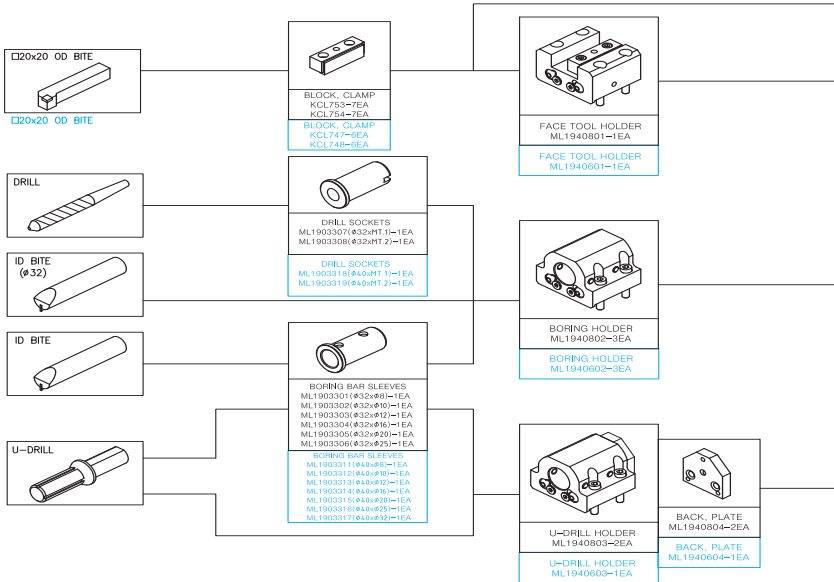
Parts Catcher



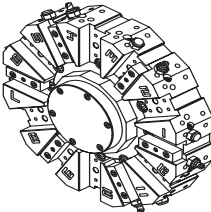
Automatic Lubricator

Standard Accessories

Tooling System

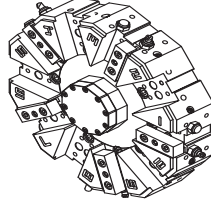


PL 1600

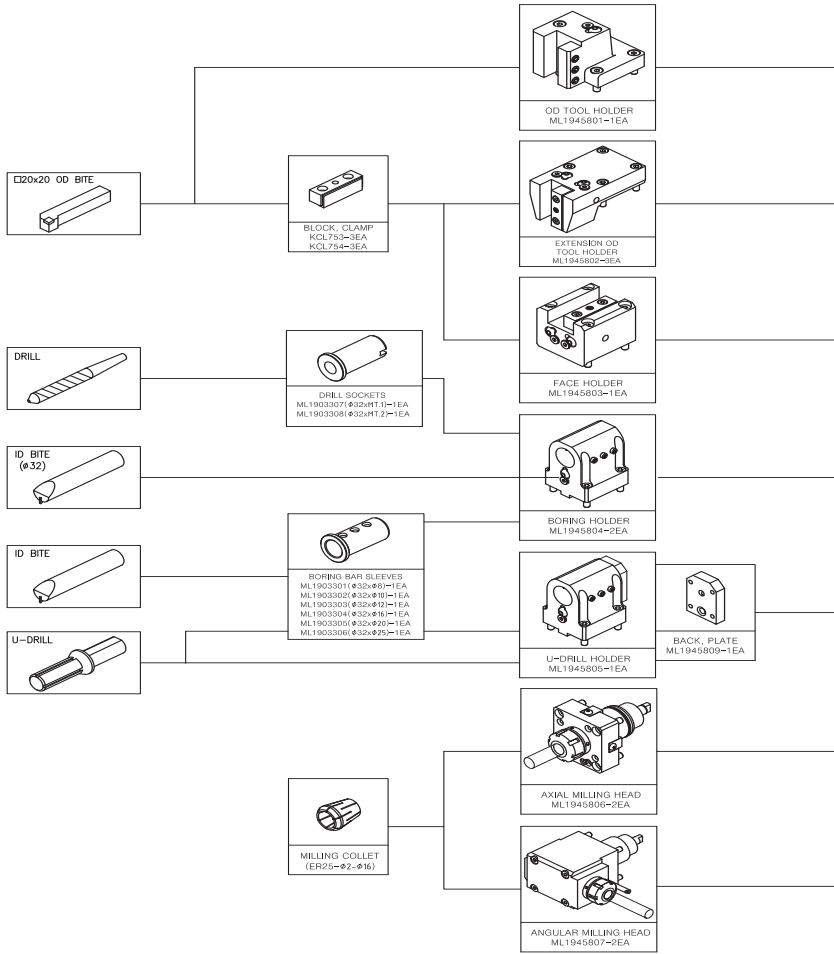


12ST TURRET

PL 1600C

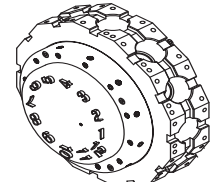


10ST TURRET



PL 1600M

PL 1600CM



12ST MILL TURRET (BMT45)

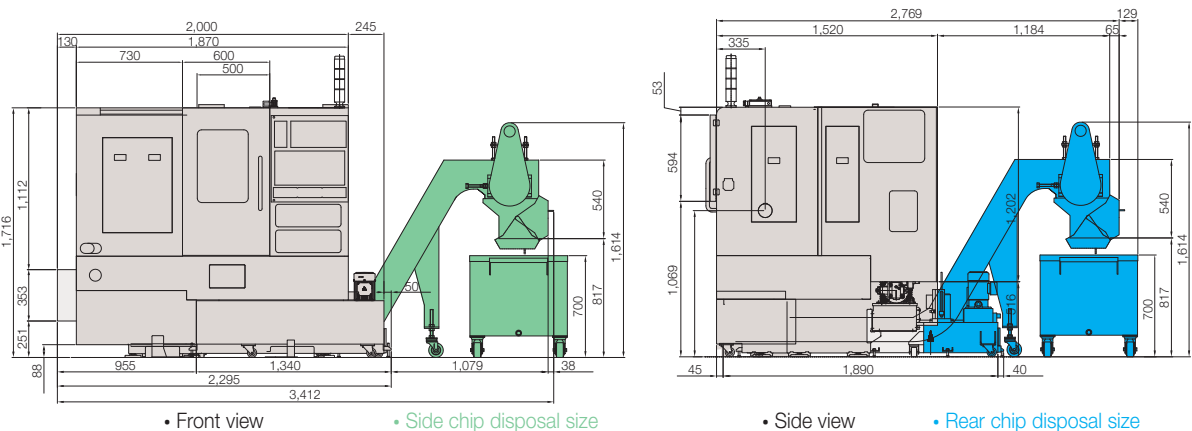
CAP. DISC
ML1945808-4EA

() : Standard Set Numbers

Machine Dimensions

PL 1600/1600M/1600C/1600CM

Unit : mm



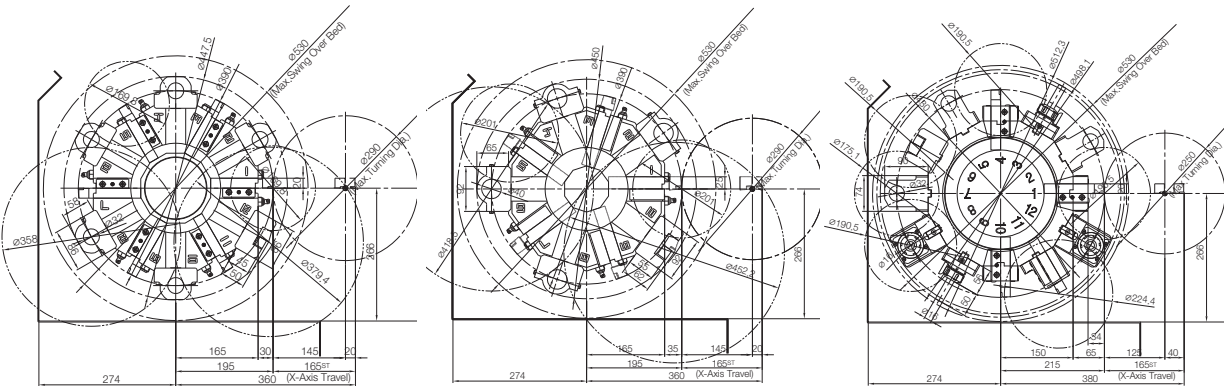
Turret Head Interference

Unit : mm

PL 1600

PL 1600C

PL 1600M/CM

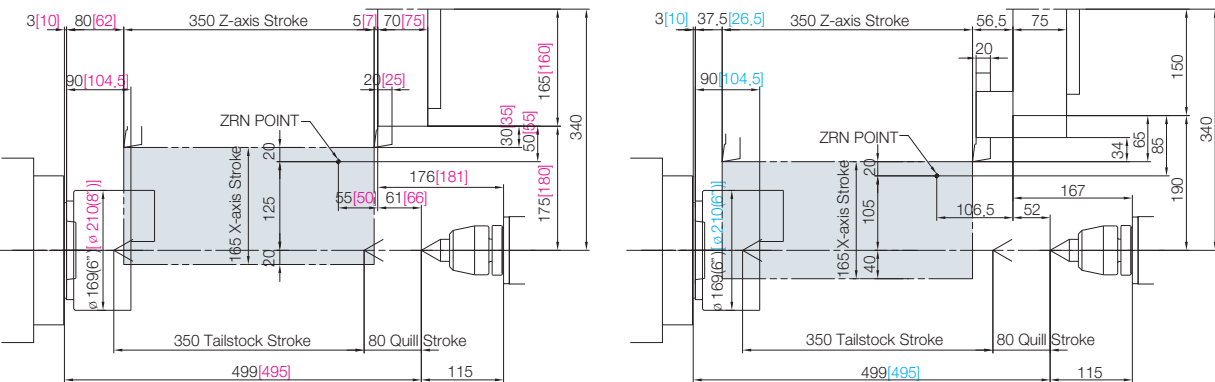


Work Range

PL 1600/1600C

PL 1600M/1600CM

Unit : mm



Major Specifications

DESCRIPTION		PL 1600	PL 1600M	PL 1600C	PL 1600CM
CAPACITY	Swing over the bed	mm	ø 530	ø 530	ø 530
	Swing over the cross slide	mm	ø 290	ø 290	ø 290
	Max. machining diameter	mm	ø 290	ø 250	ø 250
	Max. machining length	mm	307	291	270,5
MAIN SPINDLE	Chuck size	inch	6	6	8
	Spindle Speed	rpm	60~6,000	60~6,000	4,500
	Spindle nose	ASA	A2-5	A2-5	A2-6
	Bore diameter	mm	ø 53	ø 53	ø 61
	Draw tube I.D.	mm	ø 46	ø 46	ø 52
	Motor(30min/cont.)	kW	11/7,5	11/7,5	15/11
TRAVEL	X/Z axis travel	mm	165/350	165/350	165/350
	X/Z rapid traverse rate	m/min	24/30	24/30	24/30
	X/Z feed motor	kW	-	3,7/2,2	-
TURRET	Number of tool positions	st.	12 (UE-S80)	12 (BMT45)	12 (UE-S80)
	Indexing time	sec	0,2	0,15	0,2
	Shank size for square tool	mm	□20×20	□20×20	□25×25
	Shank diameter for boring bar	mm	ø 32	ø 32	ø 40
TAILSTOCK	Tailstock travel	mm	350	350	350
	Tailstock quill travel	mm	80	80	80
	Tailstock spindle taper	MT	MT4	MT4	MT4
	Tailstock quill diameter	mm	ø 65	ø 65	ø 65
ELECTRIC POWER SUPPLY		kVA/V	22 / 220	22 / 220	22 / 220
REQUIRED FLOOR SPACE (L×W)		mm	1,870×1,593	2,155×1,593	1,870×1,593
MACHINE WEIGHT		kg	2,850	3,100	2,940
CONTROLLER			Fanuc Oi-Mate TD, Oi-TD		

• Figures in inches are converted from metric measurements.

Standard Accessories

- COOLANT SYSTEM
- BUILT-IN WORK LIGHT
- SPLASH GUARD
- HAND TOOLS
- TOOL HOLDER
- 3JAW HYDRAULIC CHUCK
- SOFT JAWS 3 SETS
- LEVELING BLOCK

Optional Accessories

- HARD JAWS 1 SET
- CHIP CONVEYOR
- PARTS CATCHER
- AUTO DOOR
- AIR BLOW UNIT
- PROGRAMMABLE TAILSTOCK
- TOOL PRESETTER