

SHIMADA

Twin-Spindle /
Single-Turret NC Lathe

2SI-6
2SI-8
2SI-10



TANDEM

MULTI SPINDLE
SHIMADA MACHINE TOOL DRIVES Co., LTD.

Amazingly productive! Compact design packed with full range of capabilities

MODELS **2SI-6, 8 & 2SI-10**

Production Master Twin
CNC TWO SPINDLE INDEXER

●ZERO Idle Time — Absolute Zero Loading Time

Zero down time for loading / unloading
The in and out handling of the workpieces takes place during the machining cycle.

●Three selections for chuck size

2SI-6...6 inch,
2SI-8...8 inch,
2SI-10...10 inch chuck



●Twin-Spindle Indexing

Each spindle is alternately indexed between the machining and loading positions. Upon completion of the machining cycle, the spindle magazine—a new part into the machining zone, and, at the same time, the loading-station's chuck is unloaded and reloaded, and magazine is indexed again, and the process begins a new.

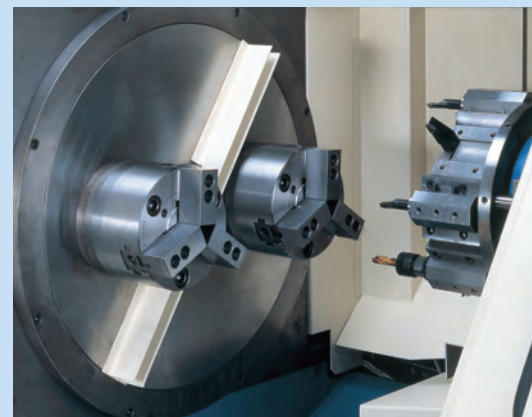


With automation.....

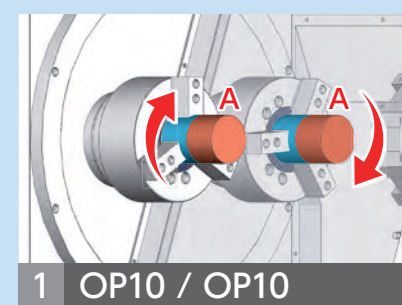
Integrated robot loader design
Quick automation setup in any location!

As a manual machine.....

The unique external loading spindle design allows easy access to the chuck for part setup with great ease!

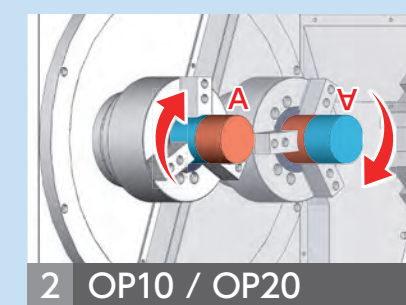


THREE MACHINING METHODS



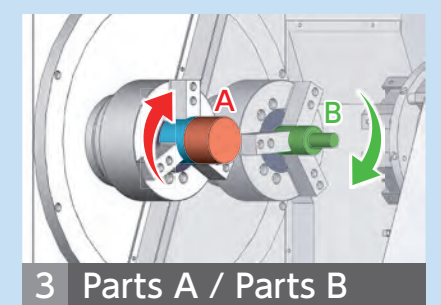
1 OP10 / OP10

High production dual parts set up



2 OP10 / OP20

Front and back side parts set up



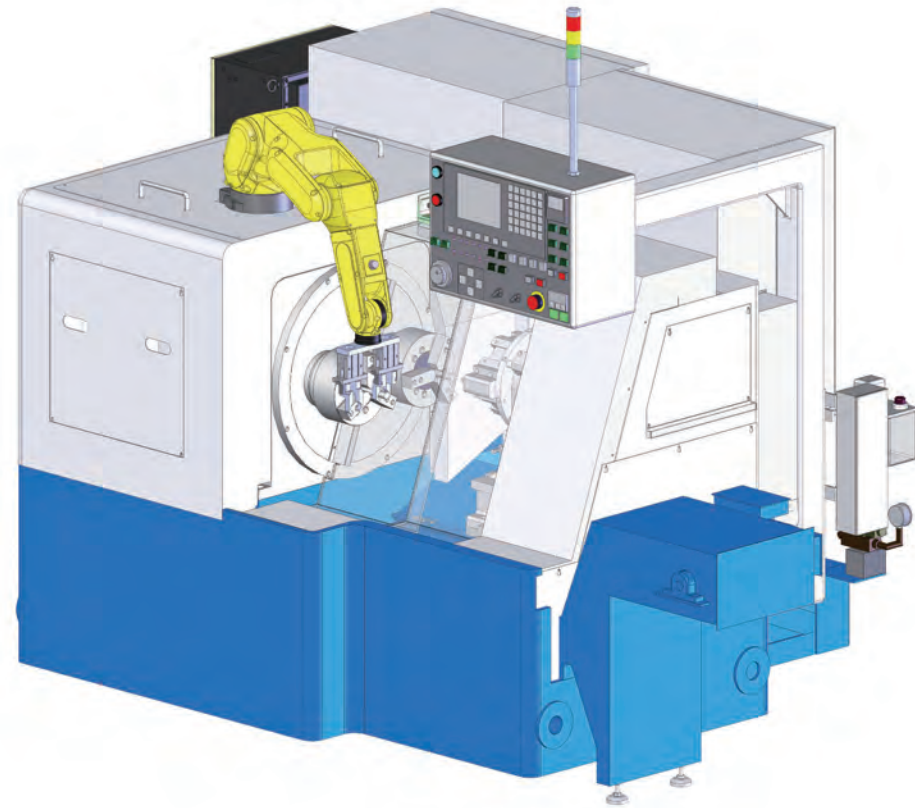
3 Parts A / Parts B

Mixed parts set up

The challenge to achieve "0" idle time

Zero down time for loading

Since workpiece loading/unloading can be performed while machining, the workpiece loading/unloading time which accounts for the largest portion of idle time has been reduced to zero.



★ Shimada's unique twin-spindle system achieves

- Zero loading allows more cutting time
- Two-sided workpiece machining with one machine
- Machine is designed to mount robot loader on top
- Twin-spindle lathe can be used manually
- OP10 and OP20 interprocess machining dissolves unbalanced cutting time during 1st and 2nd processes

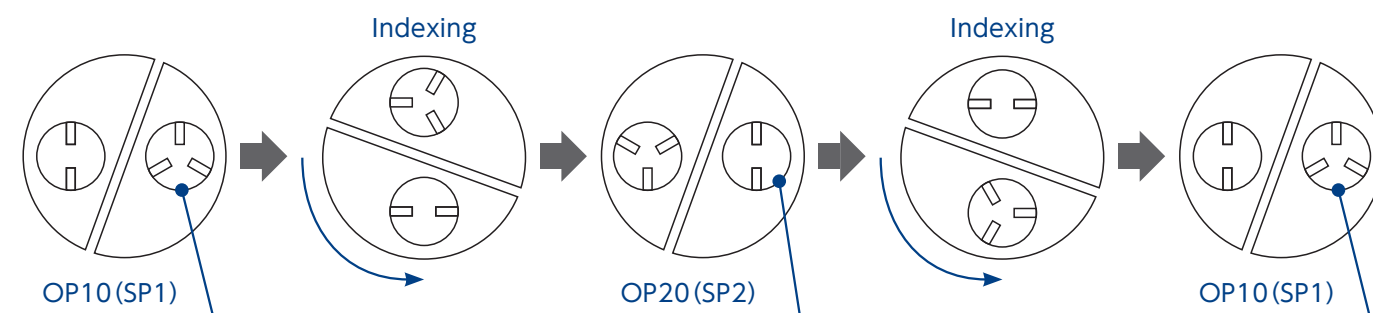
Productivity UP

Process integration /
Machine finished parts

Automation with minimal
space/footprint

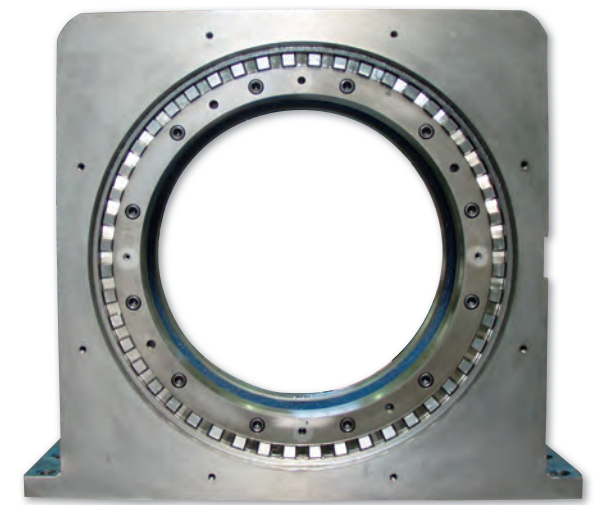
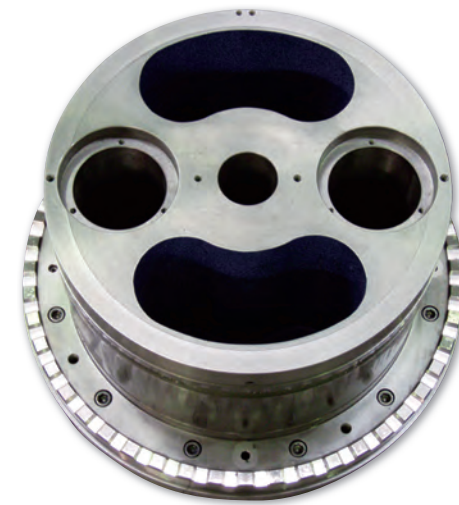
Function as two single-axis
lathe

ZERO waiting time



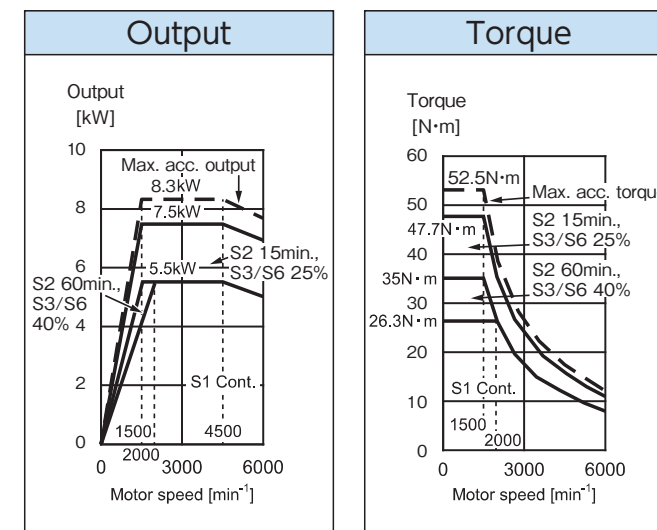
Twin-Spindle yields steady and high rigidity cutting

The spindle drum is extremely rigid, and precisely positioned by a large-diameter curvic coupling.

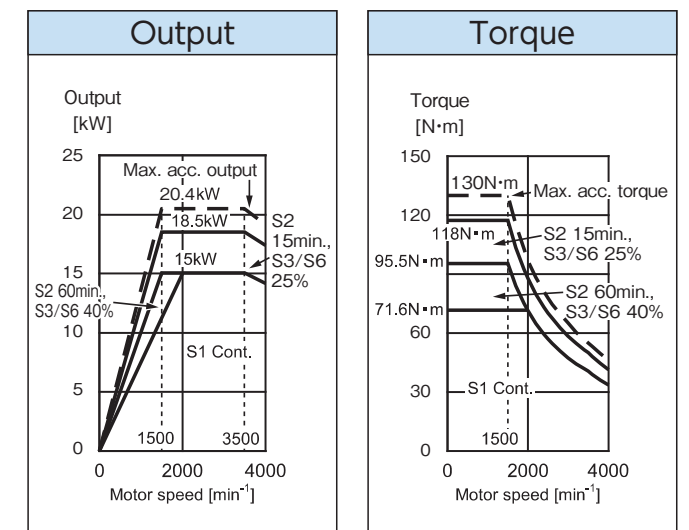


Output and Torque Curve

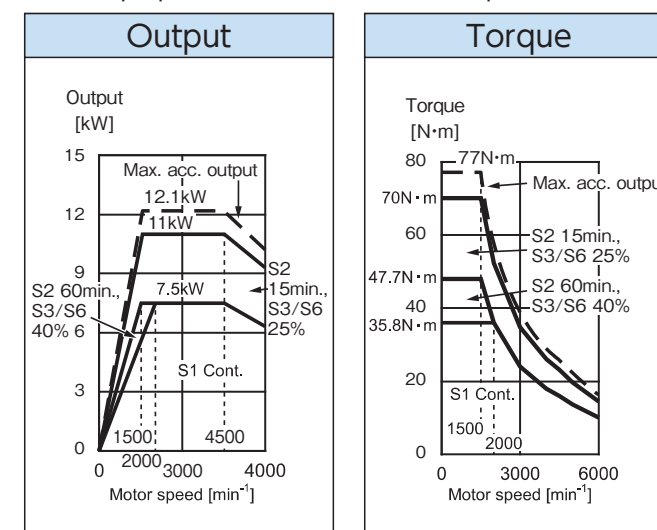
●2SI-6/8



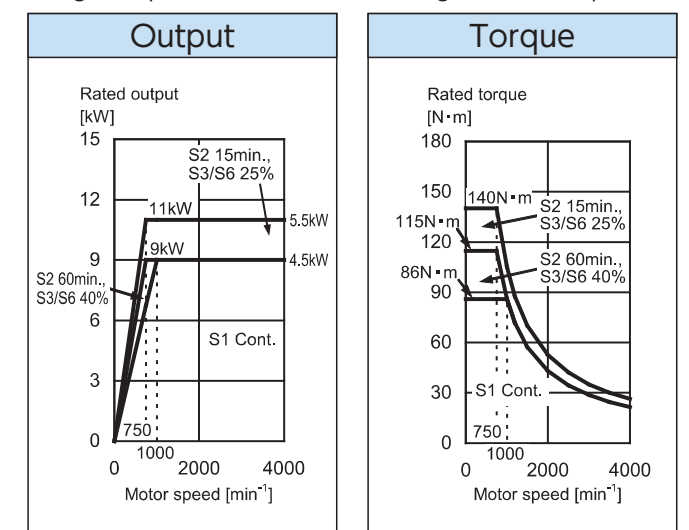
●2SI-10



※Size up spindle motor 7.5/11kW (Optional)



※High torque motor in Low RPM range 9/11kW (Optional)



Wide-ranging variations of peripheral devices (options) to support unmanned systems

Workpiece pusher device and workpiece length detection

In the 2SI series, the loading/unloading spindle is exposed outside the partition door separating the machining area. A workpiece pusher device can be installed in the opposite direction of the spindle on the loading/unloading side to attach the workpiece to the chuck.

In addition to assuring solid chucking, the length measuring function of the cylinder attached to the machine can be used for control in increments of 0.01mm. It can be used not only for detecting lifted workpieces and different part numbers from the workpiece material length, but also for checking the workpiece longitudinal dimension after machining.

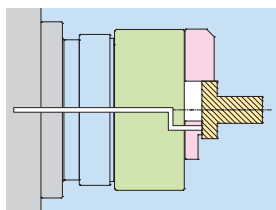


Through-Spindle Coolant Blow / Through-Spindle Air Blow

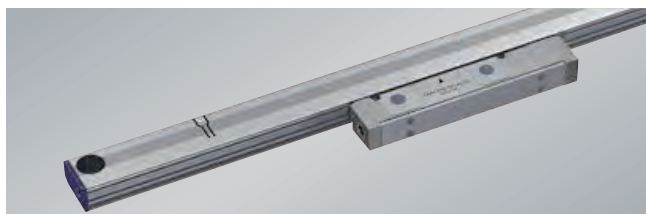
Coolant/air blow during machining from chuck center via chuck cylinder and drawbar.

Air-Seating Workpiece Adhesion Check

Checks for adhesion on the locating surface of the chuck stopper via the chuck cylinder and drawbar. When an alarm occurs, optional controls such as "cycle stop", "re-chucking with the robot or loader grabbing the workpiece again", "retry a specified number of times", etc can be performed.



Improved positioning accuracy with linear scale on NC slide for full closed-loop control. (Focus: X-Axis and Z-Axis)



Workpiece dimensional measuring device on loading/unloading spindle External Measuring Device

In the case of adjacent installation of automatic measuring equipment, we offer complete solutions including transfer equipment from the machine.

However, it is also possible to measure the workpiece before it's removed from the loading/unloading spindle chuck, a feature unique to the 2SI series. This method eliminates the need for a transfer device, saves space, reduces cost, and eliminates the need to worry about displacement and errors that may occur when workpiece is fixed to a separate measuring device.



Line-up of Stockers and Conveyors to fit wide-range of applications



- Parts Feeder
- Chip Conveyors
- Rotary Table
- Hopper/Lifter
- Pallet Changer
- Robot Slide Rail
- Parts Reversing Device
- Part Vision Detector
- +
- Conveyor Circulation System

Automation line examples

The loading/unloading spindle is located on the outside of the shielded machining area, allowing easy retrofitting of autoloader or robot. No complicated interface is required.



2SI-6

Instant measurement
Image dimension measurement
→ Palletizing



Sample Video



2SI-6

Deburring drill device at Loading spindle /
3-lines Out-conveyor



Sample Video



2SI-6

Bowl feeder + Robot with O.D.
measuring device



Sample Video

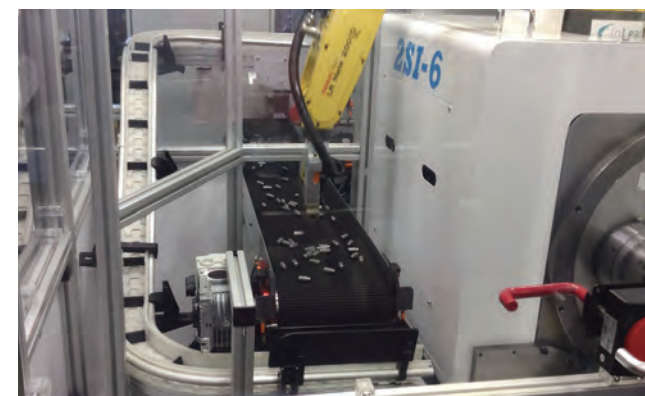


2SI-6

Robot slide rail transport /
Rotary stocker ~ Palletizing



Sample Video



Conveyor that only disperse material on the conveyor + Robot Vision System (Catches random direction work or flow to circulation)



Sample Video



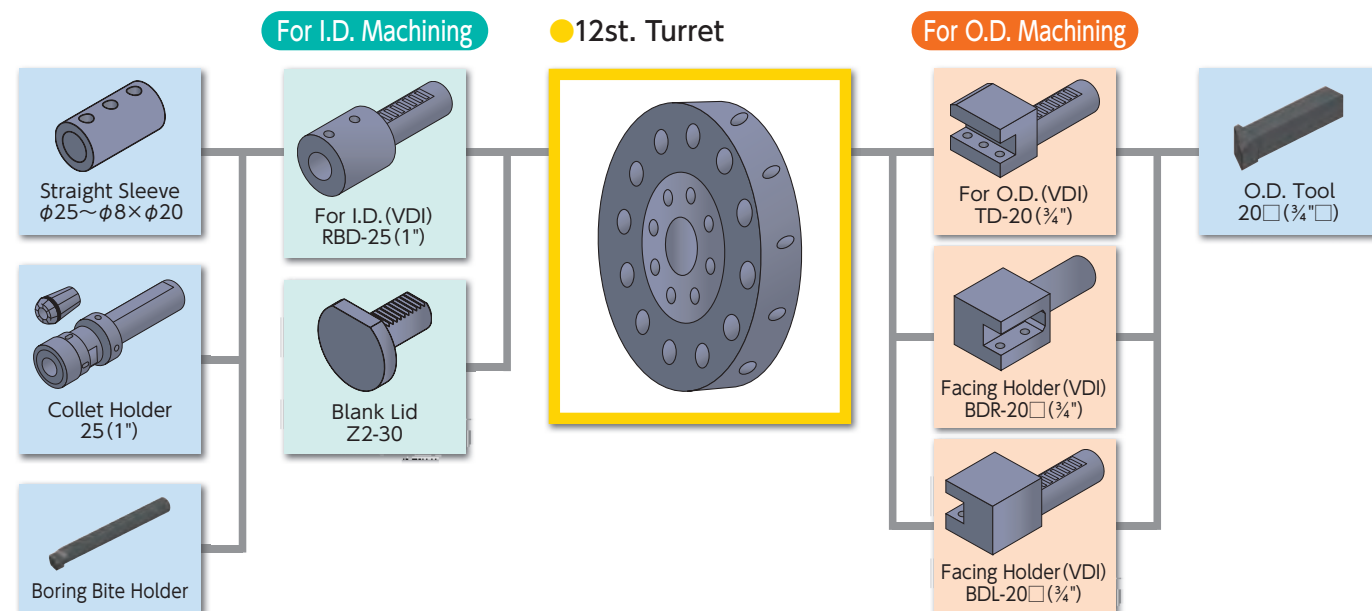
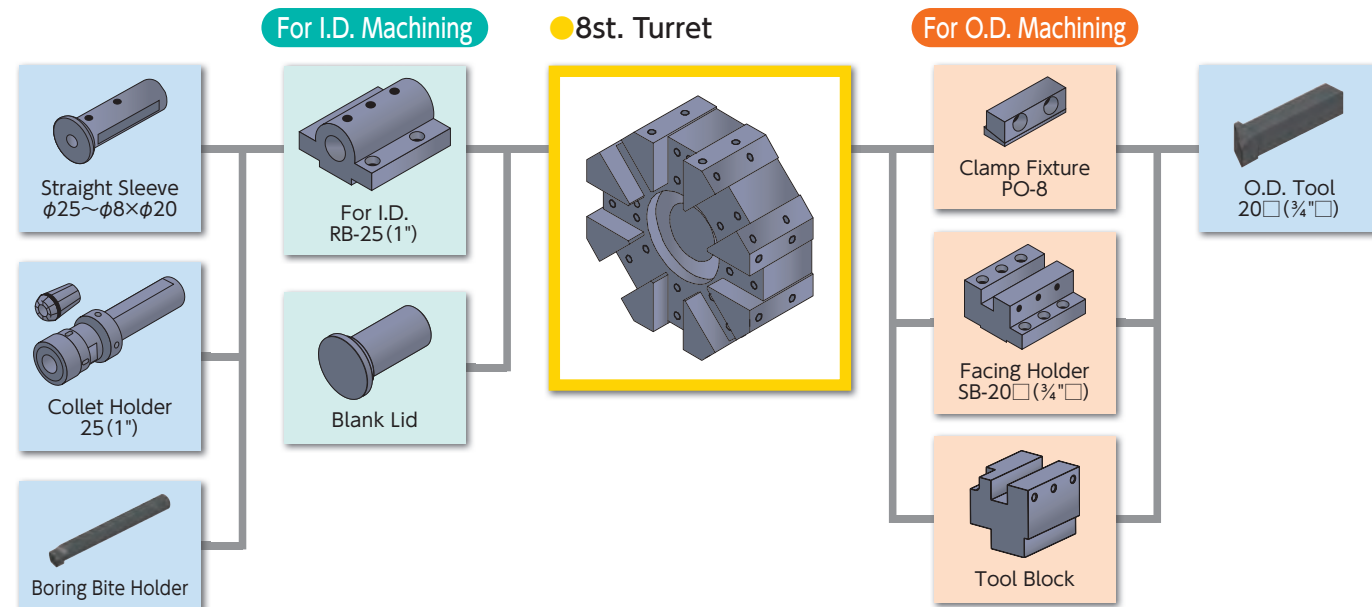
2SI-10

In - conveyor &
Out - conveyor + Robot

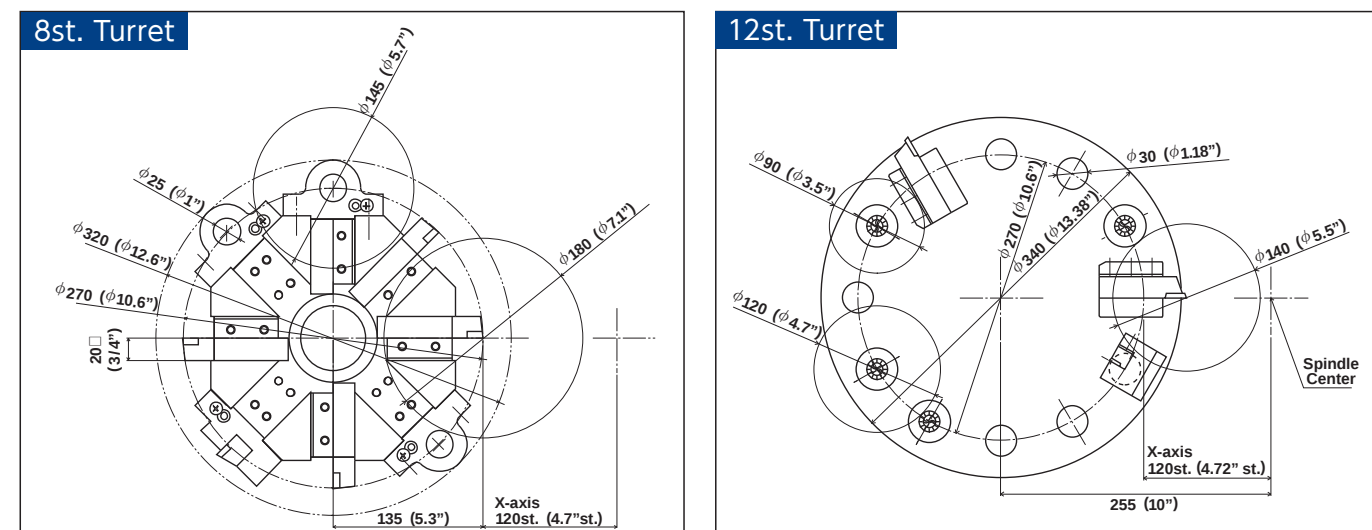


Sample Video

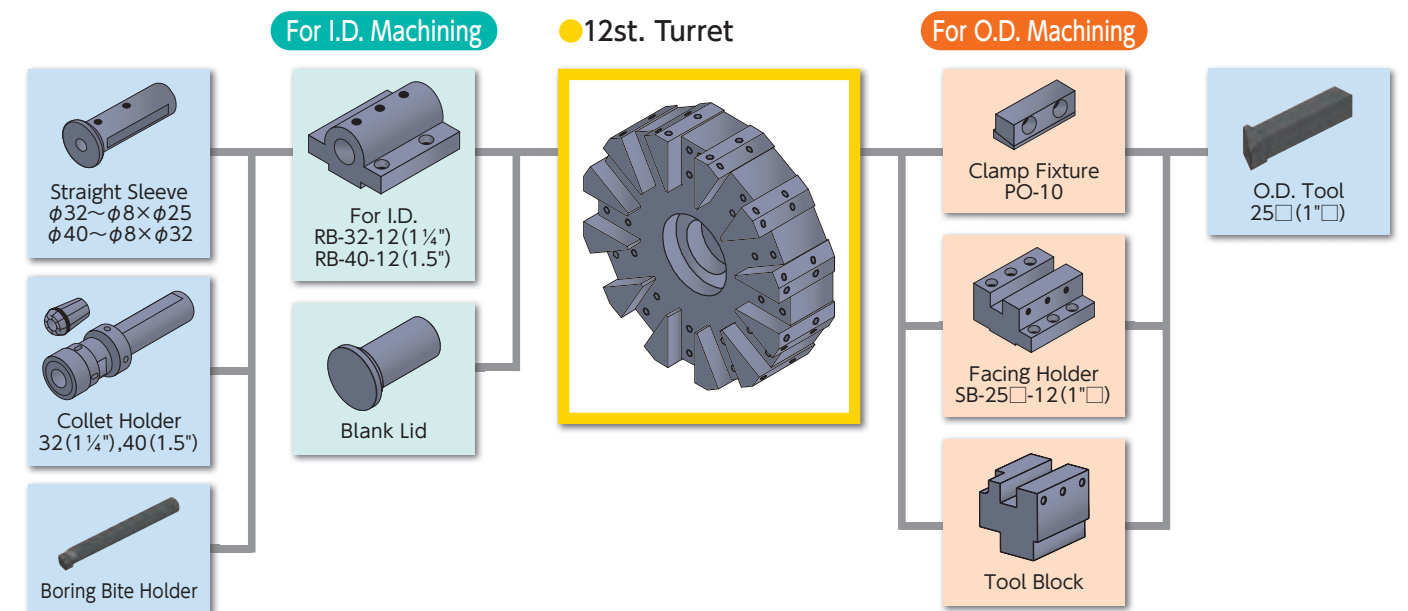
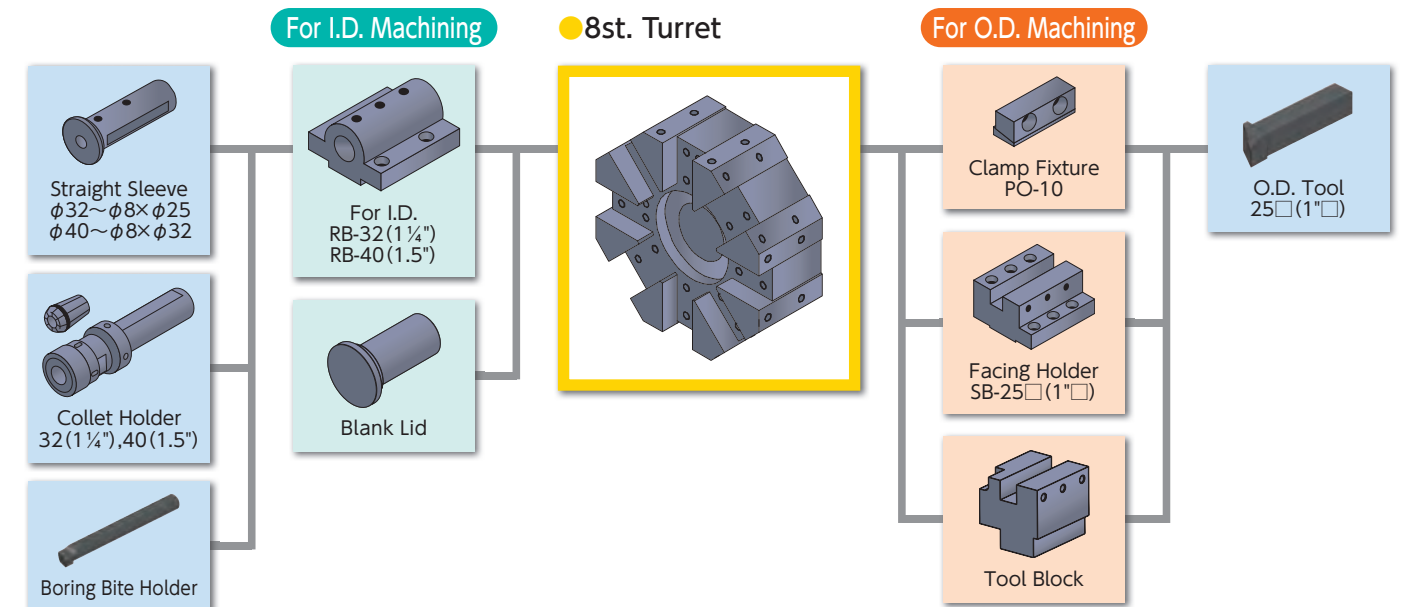
Tooling System (2SI-6,2SI-8)



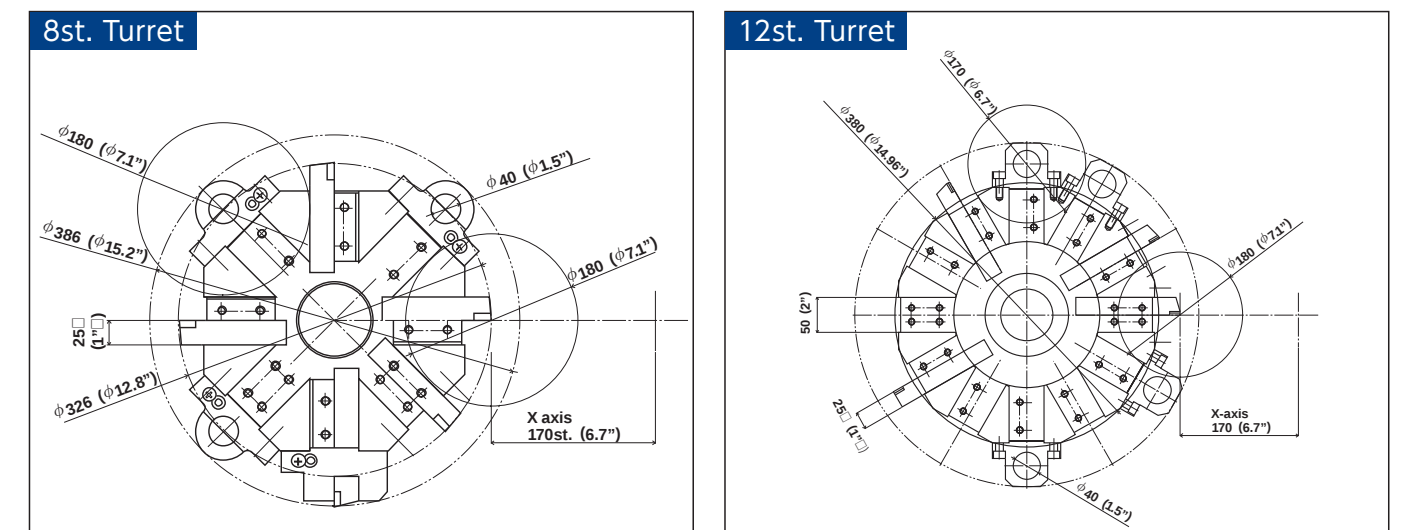
Tool Interference Diagram



Tooling System (2SI-10)

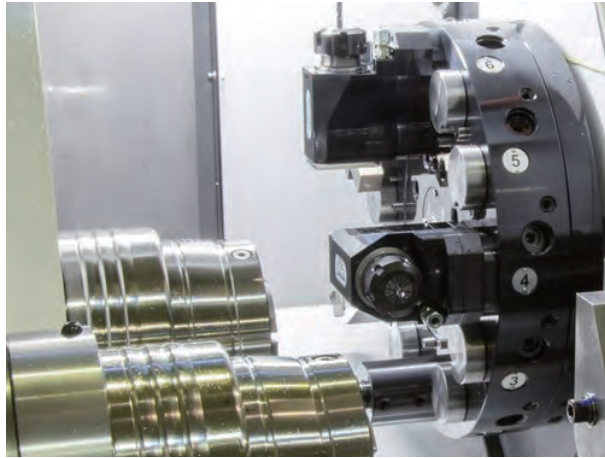


Tool Interference Diagram



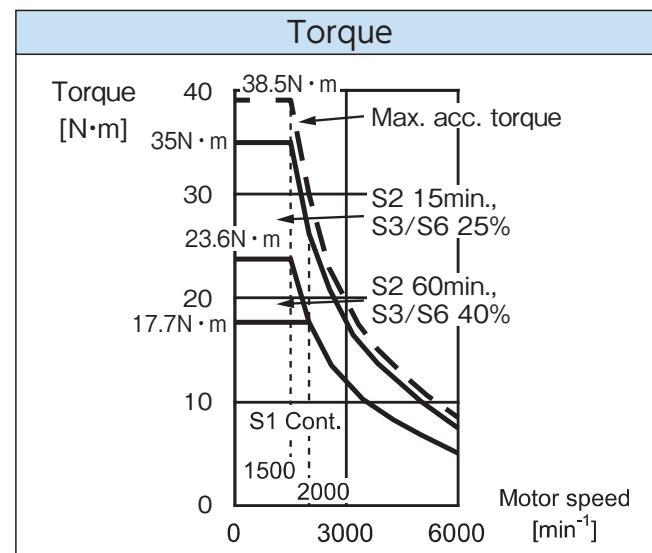
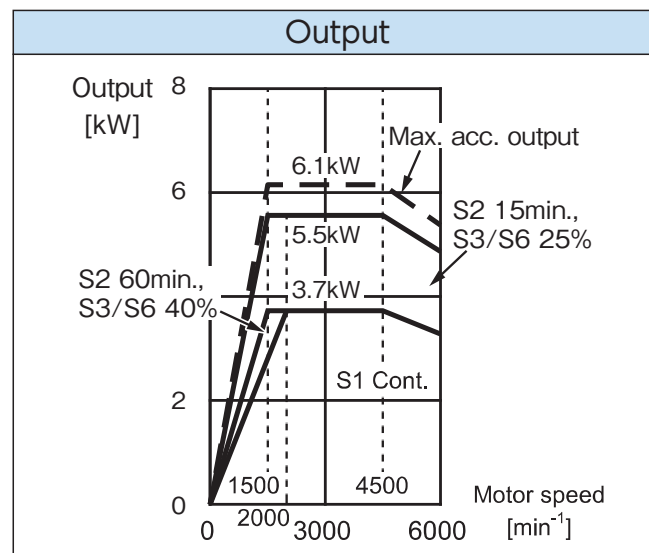
Full range of milling functions to support complex machining

Milling Function (2SI-6M , 2SI-8M , 2SI-10M)

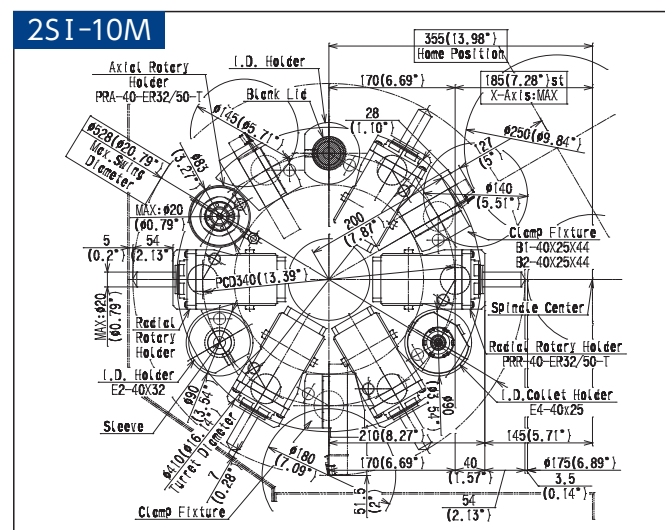
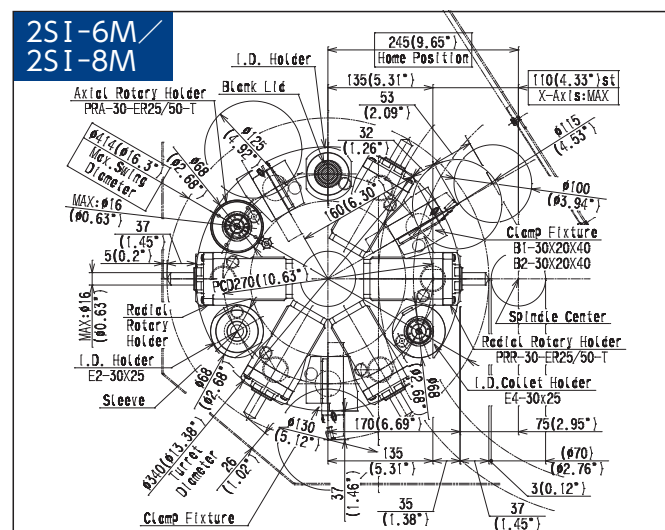


Rotary Tool Max RPM	5,000min ⁻¹
Rotary Tool Motor Output	3.7/5.5kw
Max Tooling Size	ϕ16mm (2SI-10:ϕ20mm)
Number of Turret Stations	12
Number of Rotary Tool Stations	6

Rotary Tool Motor : Output and Torque Curve



12st. Rotary Tool Turret Interference Diagrams

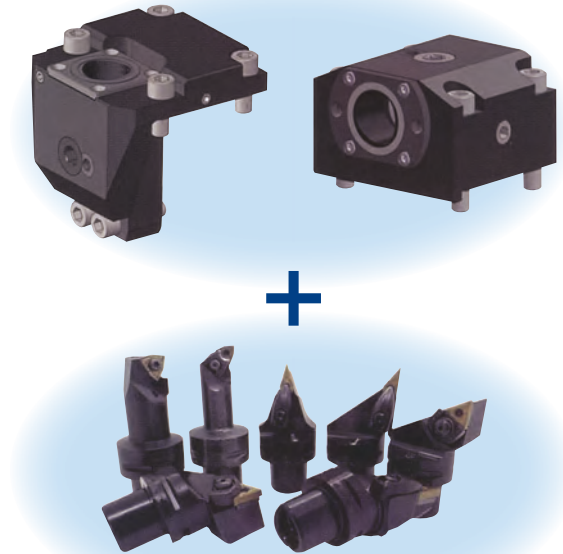
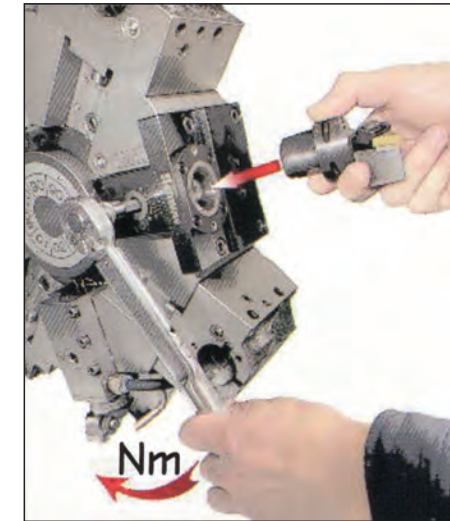


CAPTO Holder (Polygon Taper Shank "PSC" interface)

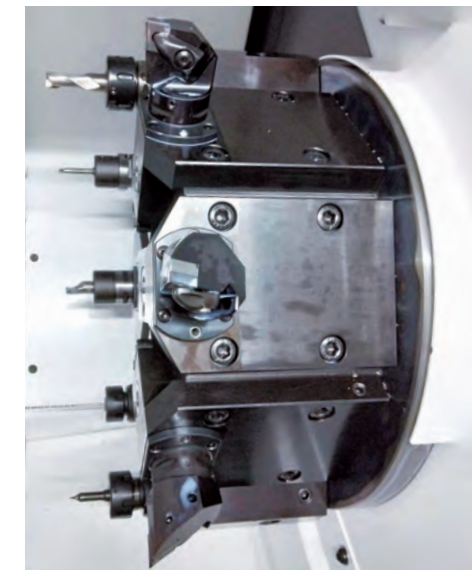
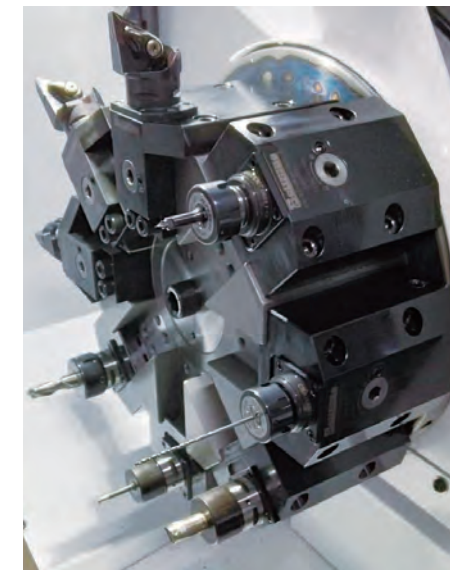
Quick change Holder

Rigid / One-touch / Improved workability

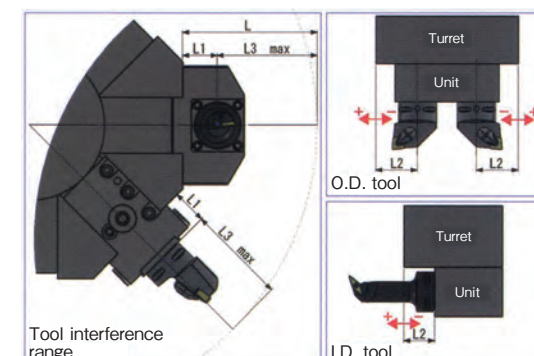
繰り返し精度 $\pm 0.002\text{mm}$



Cutting heads from various manufactures



2SI-6/8 8st. Turret

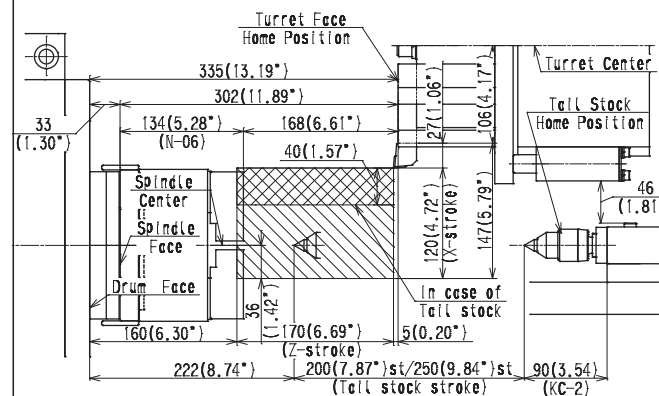


For O.D. tool					
Model	C3-BO-SMDA2328-R/L				
	Size	L	L1	L2	L3
	C3	70	22	0	48

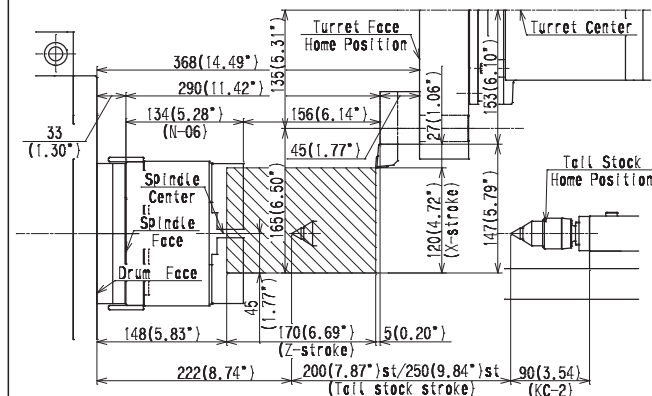
For I.D. tool					
Model	C3-BI-SMDA2327-R/L				
	Size	L	L1	L2	L3
	C3	70	25	0	45

Stroke Diagrams (2SI-6,2SI-8)

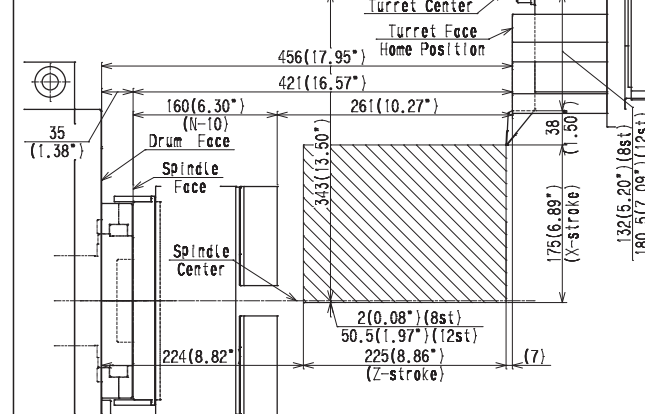
O.D. Holder 8st. Turret



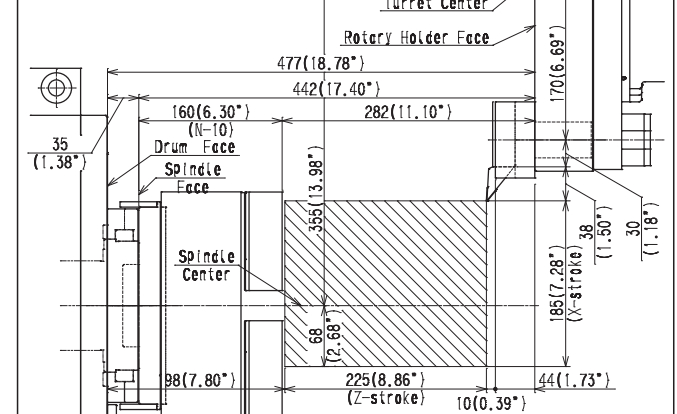
O.D. Holder 12st. Turret



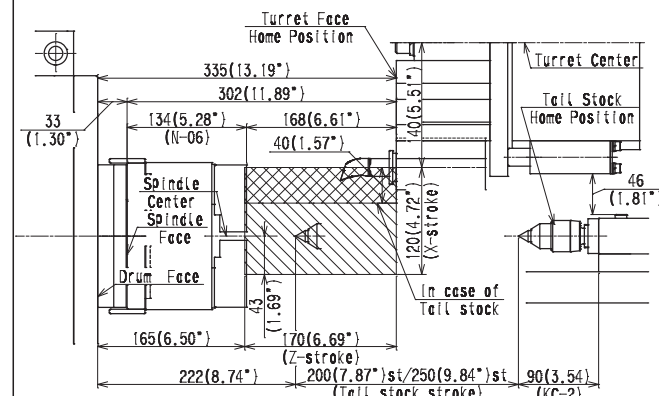
O.D. Holder 8/12st. Normal



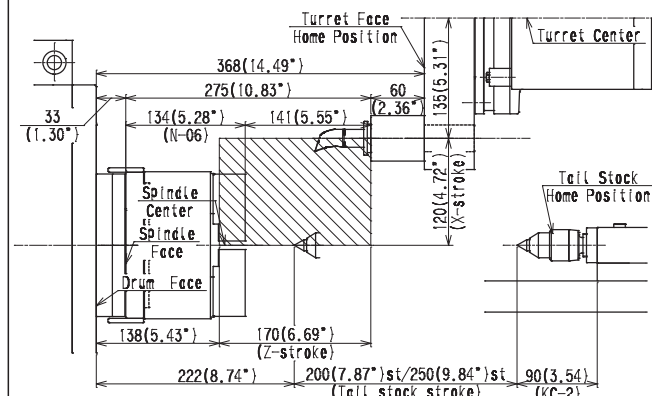
O.D. Holder 12st. Rotary Turret



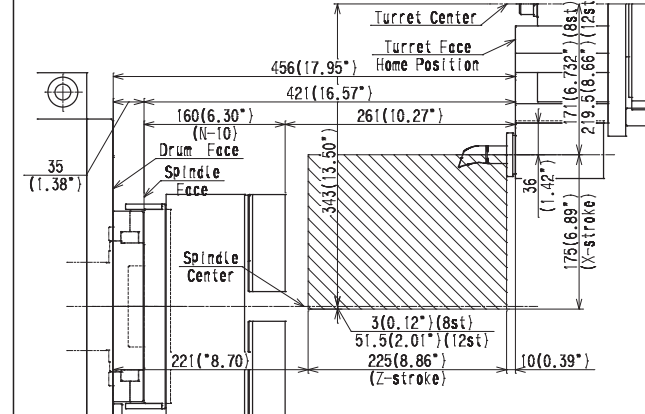
I.D. Holder 8st. Turret



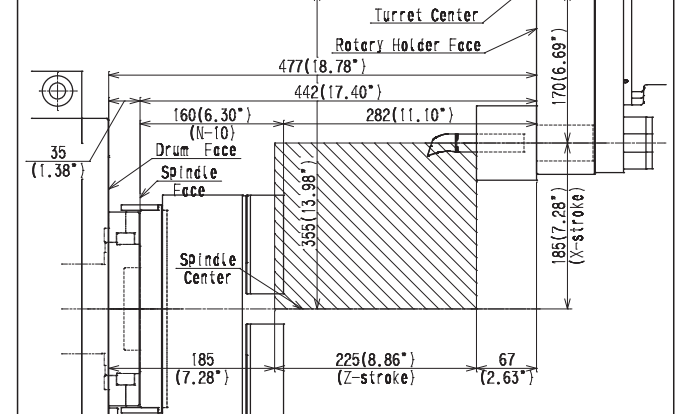
I.D. Holder 12st. Turret



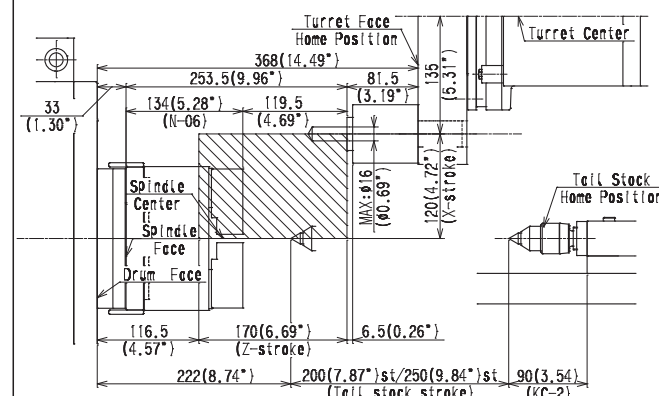
I.D. Holder 8/12st. Normal



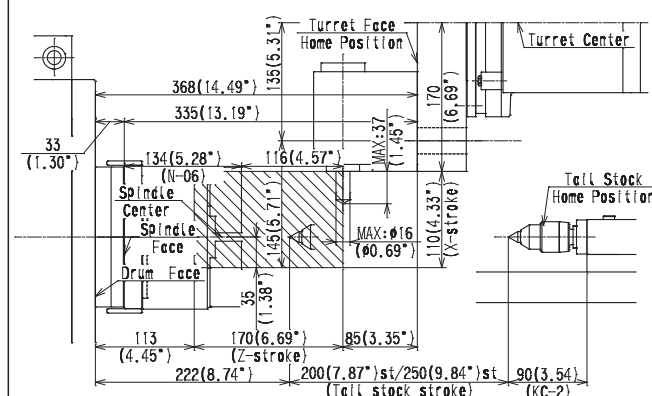
I.D. Holder 12st. Rotary Turret



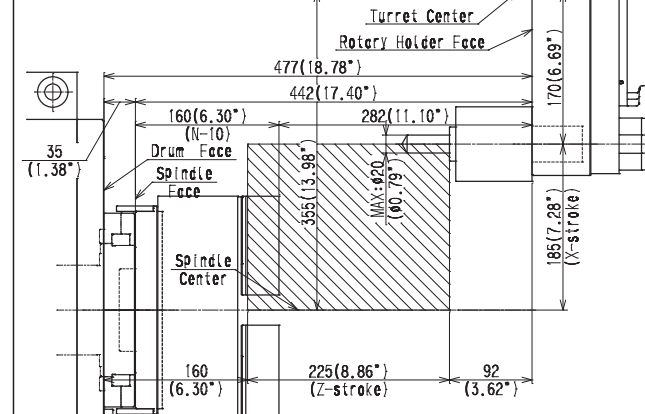
Axial Rotary Holder 12st. Turret



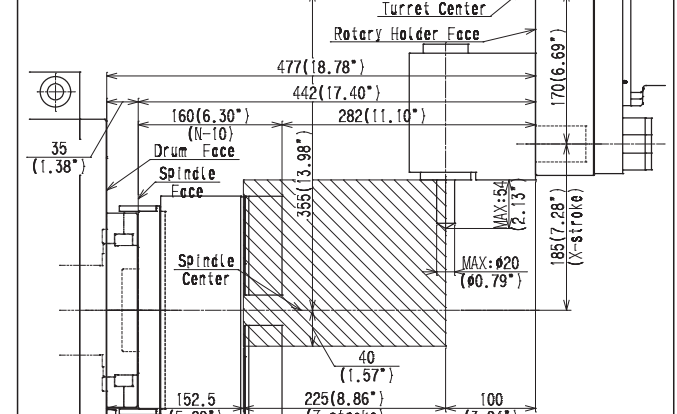
Radial Rotary Holder 12st. Turret



Axial Rotary Holder 12st. Turret



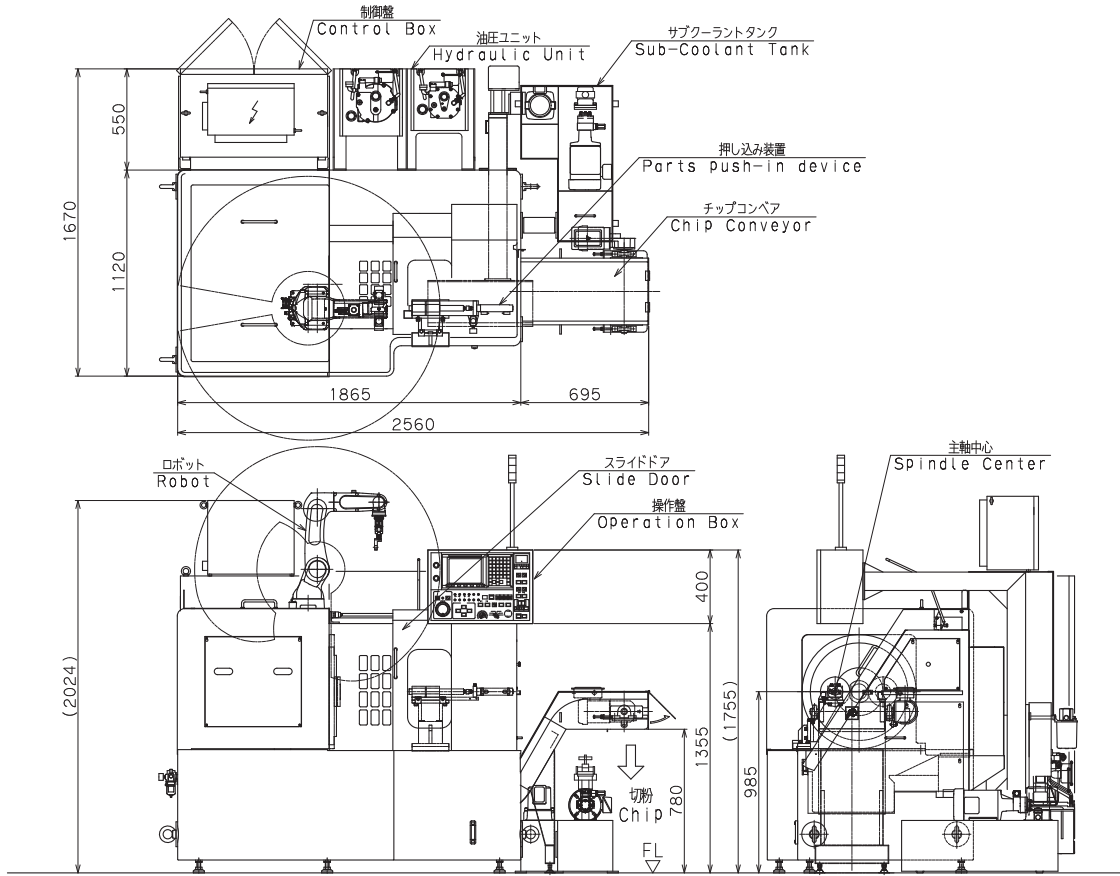
Radial Rotary Holder 12st. Turret



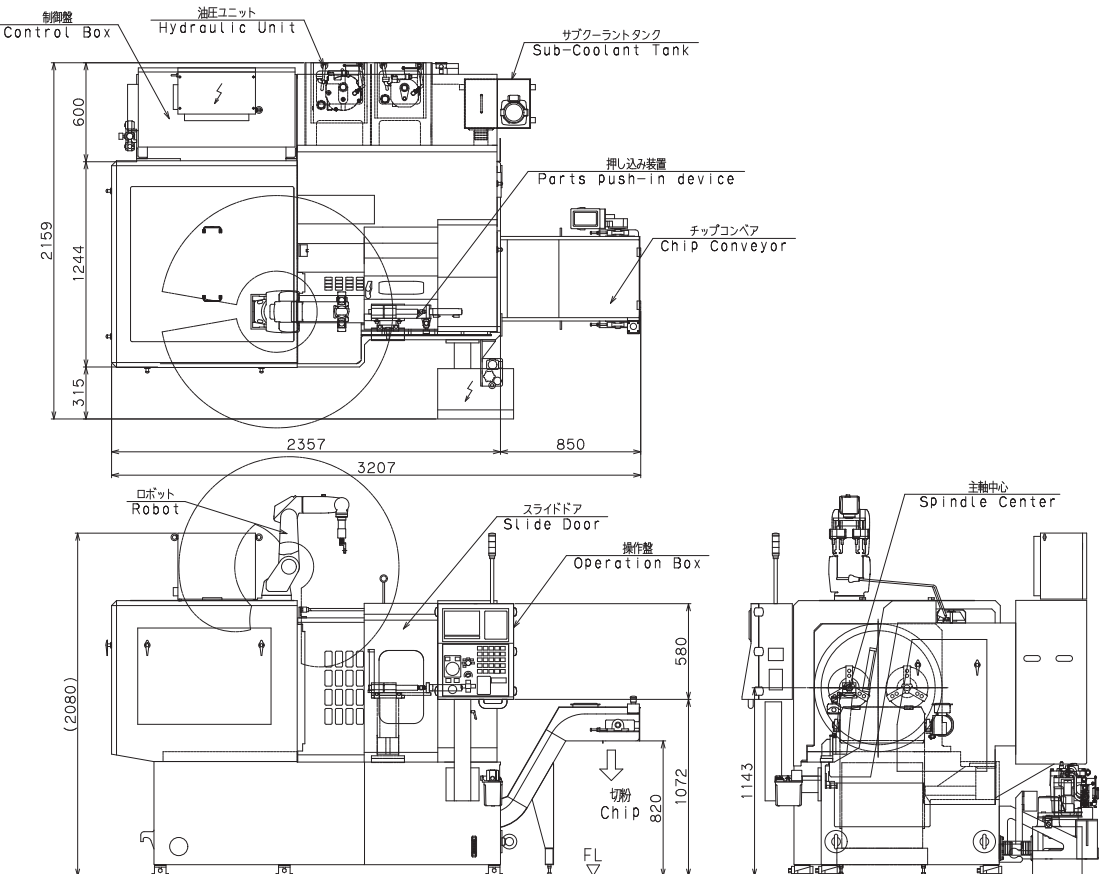
Machine Dimensions

(metric)

2SI-6 , 2SI-8



2SI-10



※Dimensions shown may change without notice due to continuous improvement and each specification.

Machine Specifications

Machine Type		2SI-6	2SI-8	2SI-10
Machining capacity	Max machining diameter	180mm	210mm	310mm
	Max machining length	120mm		200mm
	Number of spindles	2		2
Spindle	Spindle Max. RPM	5,000rpm		3,000rpm
	Chuck capacity	6"	8"	10" 12"
	Spindle motor	5.5 / 7.5kw		15/18.5kw
Turret	Spindle through diameter	42mm		67mm
	Spindle bearings I.D.	70mm		100mm
	Turret type	Std. 8st. Turret (12st. & Gang tool are optional)		Std. 8st. Turret (12st. & Gang tool are optional)
	Bite shank size(O.D. /I.D.)	□20mm/φ25mm		□25mm/φ32mm~φ40mm
	Number of Rotary tool stations	6		6
	Rotary tool spindle Max RPM	5,000rpm		5,000rpm
N.C. Slide	X-axis/Z-axis travel	X-axis:120mm / Z-axis:170mm		X-axis:170mm / Z-axis:205mm
	Rapid feed rate	15m/min		15m/min
Machine dimensions	Spindle centerline height	960mm		1100mm
	Required floor space (Width x Depth)	1865mm × 1670mm		2357mm × 2159mm
	Weight	3600kg	3800kg	5500kg
Power requirement		20KVA		30KVA
		Milling specification : 26KVA		Milling specification : 36KVA

※Max. Spindle speed: The maximum rotation speed may vary depending on chuck, jig, chuck cylinder, etc. used.

※The milling function(Rotary tool specification) is Option and it requires 12st. Turret

CNC Specifications

CNC Unit	FANUC / Oi
Controls	2-axes(X・Z)
Command increment	0.001mm
Display Unit	10.4" color display
Program memory capacity	2M bite
Number of registerable programs	1,000
Number of tool offset pairs	98
Override of cutting feed	0-150%
Input / Output Interface	USB memory port, Memory card
External communication interface	Embedded Ethernet

Other CNC Functions

- Inch/Metric Modes ●Single block ●Custom macro
- Tool radius / Tool noseradius compensation
- Multi threading ●Tool life management
- Alarm history display ●Graphic display
- Machine lock ●Tool geometry / wear compensation
- Variable lead thread cutting ●Multiple repetitive cycle
- Spindle setting screen ●Dry run
- Direct drawing dimension programming
- Multi-language display ●others

Standard Accessories

- Hydraulic unit ●Coolant device ●Total splash guard
- Auto door ●Work light ●Hand tool kit
- Foot switch & Drum index confirmation button
(In case of manual loading)

Options

- Milling function(Rotary tool specification) ●Tail-stock
- Through-spindle specification
- Through spindle coolant ●High-pressure coolant
- Air-chuck specification
- Workpiece pusher device (Parts push-in unit)
- Parts push-in length detection ●Spindle motor size up
- Robot ●Gantry loader ●Parts reversing unit
- Parts stocker ●In / Out conveyor
- Parts vision system with Robot
- Workpiece dimensional measuring device
- Robot slide rail transport ●Robot safety guard
- Chip conveyor ●Mist collector ●Tool holder
- Servo learning oscillation
- Quick Change Holder (CAPTO Holder)

※Specifications are subject to change without notice due to continuous improvements.



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