CNC Multi-Turning Center

XY series

TAKAMAZ

CNC Multi-Turning Center

XY series

From Blank to Finish with a Single Switch!

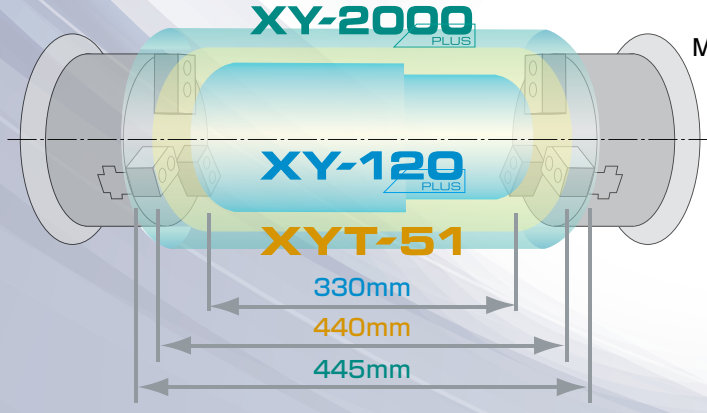
The answer is here.
it's XY series !

From the age of mass production to optimal quantity production
Supporting optimal creation of new things through
intelligent fusion of man and machine,
the XY series is the ideal machine for a new era.

Turning range

Max. turning diameter #1 Turret

- XY-2000 PLUS: ϕ240mm
- XY-120 PLUS: ϕ190mm
- XYT-51: ϕ170mm



Max. turning diameter #2 Turret

- XY-2000 PLUS: ϕ240mm
- XY-120 PLUS: ϕ190mm
- XYT-51: ϕ135mm

Max. bar diameter

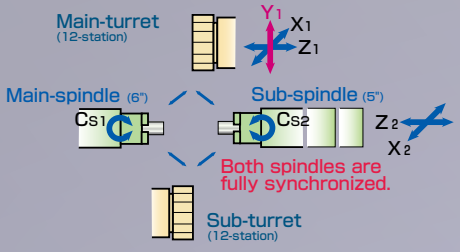
- XY-2000 PLUS: ϕ65
- XY-120 PLUS: ϕ51
- XYT-51: ϕ51

※The available turning range varies depending on the chuck size or part shape.

XY-120 PLUS

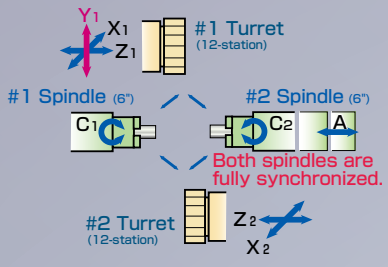
This middle size multi-turning center is equipped with the sub-spindle X2 axis to enable superimposed cutting and can be installed with an optional sub-turret, which further helps shorten turning time.
Compared to conventional machines, higher-grade motors are used to achieve an OD turning area of 0.87 mm² (10% increase) on the main-spindle side and 0.5 mm² (13% increase) on the sub-spindle side.

※Cutting amount×Feedrate.



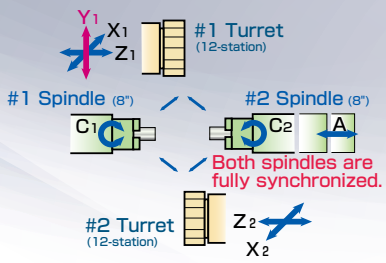
XYT-51 NEW

Suited to bar work up to max. ϕ51 mm, and able to accommodate a maximum of 48 turning tools through half indexing or 24 power tools. Increasing motor output beyond that of the existing machines allows it to handle heavy-duty cutting and compound machining.



XY-2000 PLUS

Suitable for bar materials of ϕ65 mm maximum. 24 power tools can be installed on #1 and #2 turrets, enabling highly efficient multi-turning operation from blank to finish.
VDI tooling systems are also available for European countries, which can shorten setup time.

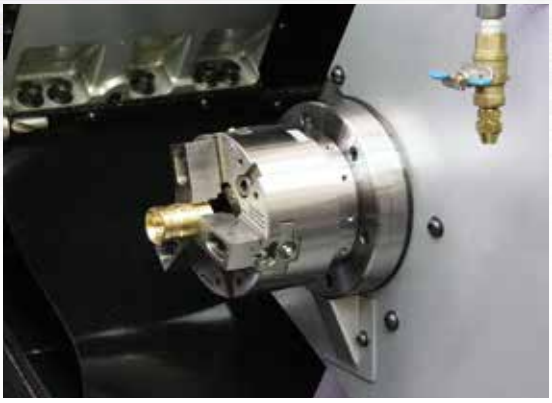


Machines shown in the photos are in standard color.
Environmentally friendly powder coating is applied.

Turning and milling available with the Y axis for power tools

Equipped with a Y axis and milling function, multi-turning operation equivalent to machining centers is possible. By using the Y axis, multi-turning operations such as polar coordinate interpolation and cylindrical interpolation which were conventionally difficult with turning machines are made simpler with high precision.

	Y-axis cutting range	Power tool storage capacity	Power tool capacity
XY-120 PLUS	± 35mm	12 tools / turret	ϕ13mm,M8mm
XYT-51	± 35mm	12 tools / #1 turret 12 tools / #2 turret	ϕ13mm,M12mm ϕ13mm,M12mm
XY-2000 PLUS	± 40mm	12 tools / #1 turret 12 tools / #2 turret	ϕ16mm,M16mm ϕ16mm,M16mm



Sub-spindle provided for shaft work and blank-to-finish cutting on both front and back faces

A sub-spindle having the same capability as the main-spindle enables back face cutting of the second process in a single machine structure. Fully synchronized rotation of both spindles offers high precision and uniform finish shaft work.

	Sub-spindle Chuck size	Spindle speed	Stroke
XY-120 PLUS	5 inches	Max.5,000min^{-1}	440mm
XYT-51	6 inches	Max.5,000min^{-1}	550mm
XY-2000 PLUS	8 inches	Max.4,000min^{-1}	570mm

Speedy setup change with VDI turrets

Quick change type tool posts (VDI) are featured on both the #1 and #2 turret and greatly reduce the tool mounting time.

	#1 Turret	#2 Turret	Tool storage capacity
XY-2000 PLUS	No.40	No.40	12 tools / turret

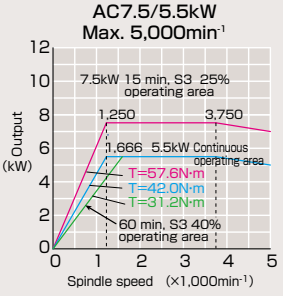
Indexing time (common): 0.2 sec (1 station), 0.6 sec (6 stations)

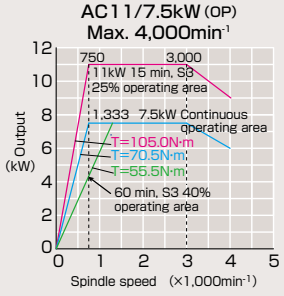
Power Characteristic Curve

A wide range of high performance motors are available according to your needs from high horsepower to high speed rotation.

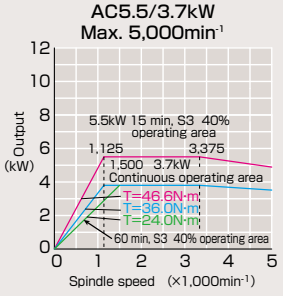
XY-120 PLUS

Main-spindle





Sub-spindle

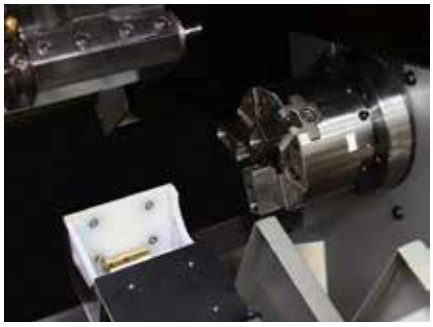


Cylinder blocks
(car air-conditioners)

Pistons

Sleeves, body valves

Gear sleeves



Bar work automated with parts catcher

The parts catcher can be configured to the most appropriate part-receiving timing by programming and, if combined with an automatic bar feeder, enables extended unmanned operation of bar work.

FANUC Manual Guide i installed for good and easy-to-use programming

Cutting cycles for milling, turning, inclined cutting and more can be programmed with ease and simulated in realistic graphical representation, which will dramatically shorten programming time.

Swivable operation panel for good operability

To reduce the operator's burden, a swivable operation panel is employed in consideration of minimizing the operator's motion area. Operations in good posture support a strain-free, efficient and safe working environment.

Chip conveyor for chip accumulation prevention

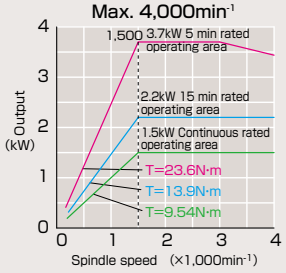
The slant bed structure of the XY series assures a smooth flow of chips. Even if chips have complex shapes depending on cutting conditions, using a chip conveyor in combination can remove such chips smoothly from the machine.

Consideration to maintenance and environment

For ease of maintenance and good operability, the chuck pressure regulating valve and lubrication pump are arranged on the front face of the machine. A periodical inspection notice function notifies the time of battery replacement and hydraulic pump inspection to support control of maintenance and help keep the machine in top condition all the time. In addition, the XY-120plus is equipped with high-performance motors.

Power tools

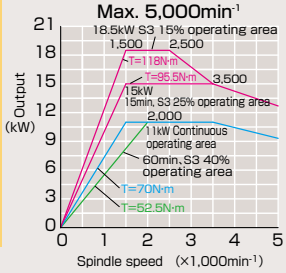
AC3.7/2.2/1.5kW
Max. 4,000min^{-1}



XYT-51

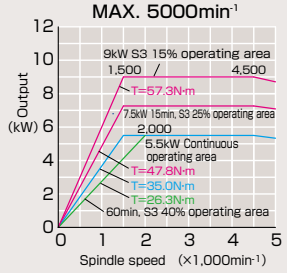
Main-spindle

AC18.5/15/11kW
Max. 5,000min^{-1}



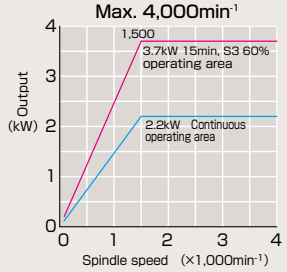
Sub-spindle

AC9/7. 5/5. 5kW
MAX. 5000min^{-1}



Power tools

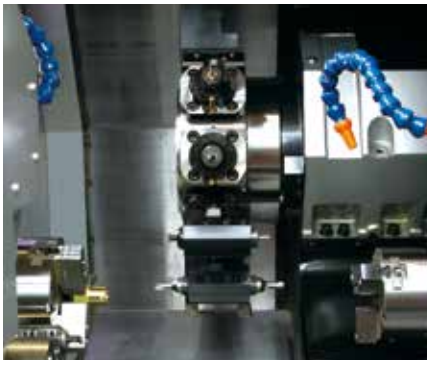
AC3.7/2.2kW
Max. 4,000min^{-1}



XY-120 PLUS

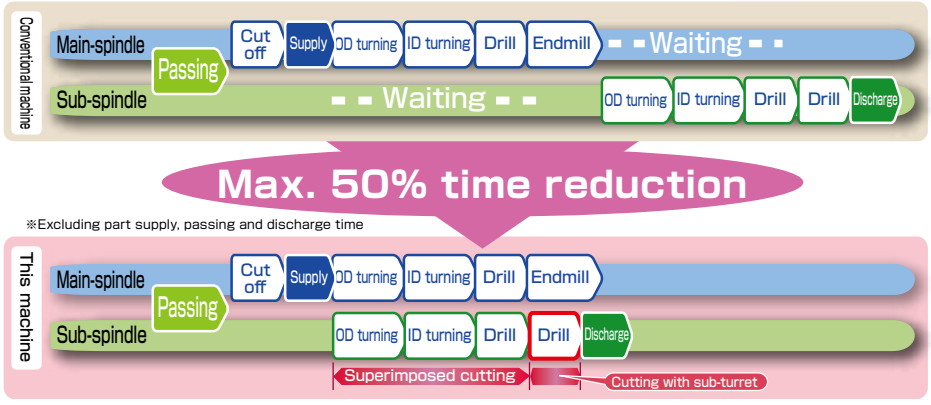
Superimposed Cutting

Simultaneous front and back face cutting is available by using the sub-spindle axis.



Cycle time shortened with superimposed cutting

X2 axis configuration is added to the sub-spindle slide to enable X- and Z-axis superimposed cutting. An optional sub-turret further enables superimposed cutting simultaneously on the main-spindle and the sub-spindle, which contributes to drastic cycle time reduction. (See the chart below.)



Sufficient tool storage capacity

The 12-station main-turret with the intermediate indexing function has 24 tool storage positions or if a sub-turret is installed 36 tool storage positions, reducing the number of tool setup times that might be required frequently during various kinds various volumes production.
A maximum of 12 power tools for drilling of up to ϕ13 mm can be installed.

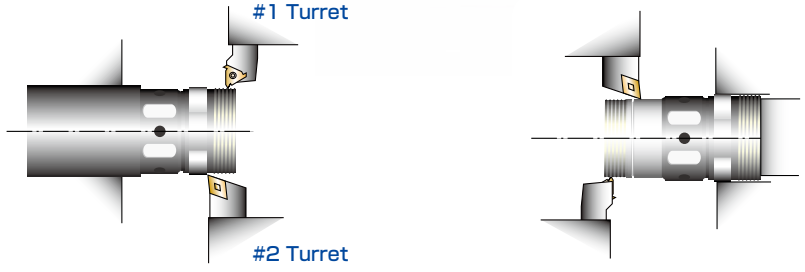
XYT-51 / XY-2000 PLUS

BALANCE CUT

#1 and #2 turrets are synchronized during OD turning for high precision balance cutting.

By applying two synchronized turning tools (for example, a rough turning tool and a finish turning tool) simultaneously from both sides, part deflection can be dampened, achieving high cutting precision and shorter cycle times.

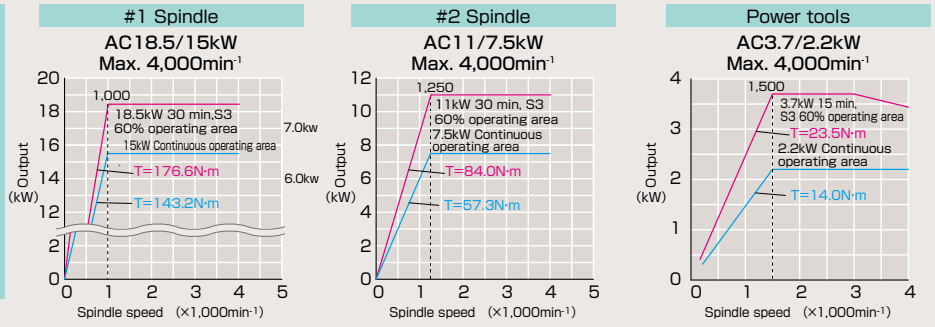
#1 Spindle side	On the #2 spindle side



Power Characteristic Curve

A wide range of high performance motors are available according to your needs from high horsepower to high speed rotation.

XY-2000 PLUS



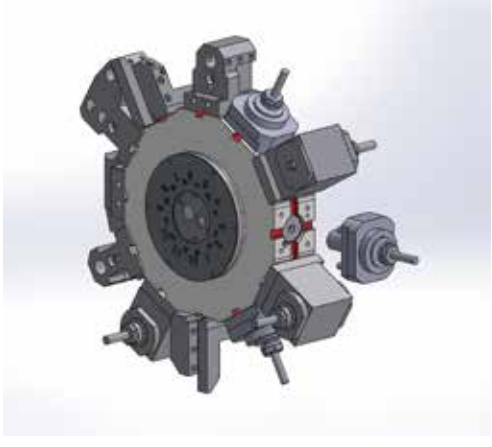
XYT-51 NEW

The XY series machines have a spacious cutting chamber which makes in-machine work such as setup changes easier and provides a turning range flexible with varied workpieces.

Chip expulsion and dust-proofing are also improved compared to existing machines, and the 60° angled cover under the turret reduces retention of chips in the machine, and improves the chip removal capability which is required by a multi-turning center. Linear guides with excellent dust-proofing are adopted.

Sliding door adopted for ease of maintenance

The right side cover of the machine can be slid as a maintenance door.
A large maintenance area can be secured, which facilitates maintenance or inspections and helps to reduce machine failures and trouble.



Use of bolt mount system (BMT45)

The XYT-51 adopts the new global standard BMT system. This is a holder securing system using four bolts and key grooves.
It is compatible with a wide range of attachments and a variety of tooling layouts by each holder manufacturer, enabling turning and milling tailored to your needs of production.

Reliable workmanship

The XY series machines employ precision scraped square slideways. With excellent rigidity, these slideways ensure stable cutting accuracy at all times. Based on our proven technology from 60 years of experience in machine tool building, our machines have high durability that withstands long-term use, enhancing customer satisfaction.

XY-2000 PLUS (Reference values)

OD turning capacity

Cutting cross-sectional area

#1 Spindle side	#2 Spindle side
2.35㎟	0.95㎟

Material	S45C
Spindle speed	500~2,000 min^{-1}
Cutting speed	150 m/min
Feed rate	0.2~0.4 mm/rev.
Depth of cut	3.0~5.0 mm

Grooving capacity

#1 Spindle side	#2 Spindle side
6㎜ (L:114㎜)	5㎜ (L:87㎜)

Material	S45C
Spindle speed	430 min^{-1}
Cutting speed	100 m/min
Feed rate	0.1 mm/rev.
Depth of cut	3.0 mm

Power tool capacity

Drill

#1 ／ #2 Spindle

ϕ25㎜

Material	S45C
Spindle speed	255 min^{-1}
Cutting speed	20 m/min
Feed rate	0.1~0.25 mm/rev.
Depth of cut	25.0 mm

Surface roughness

#1 Spindle side	#2 Spindle side
0.49μm	0.29μm

Out of roundness

#1 Spindle side	#2 Spindle side
0.62μm	0.45μm

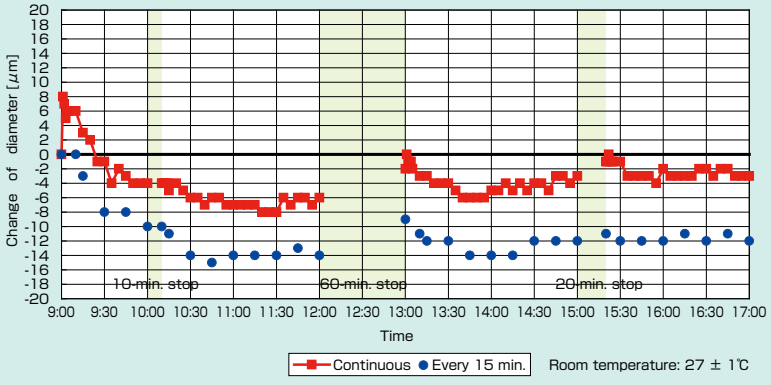
Material	C3604BD
Spindle speed	2,000 min^{-1}
Cutting speed	180 m/min
Feed rate	0.2~0.002 mm/rev.
Depth of cut	0.1 mm

Variation with time (#2 Spindle side)

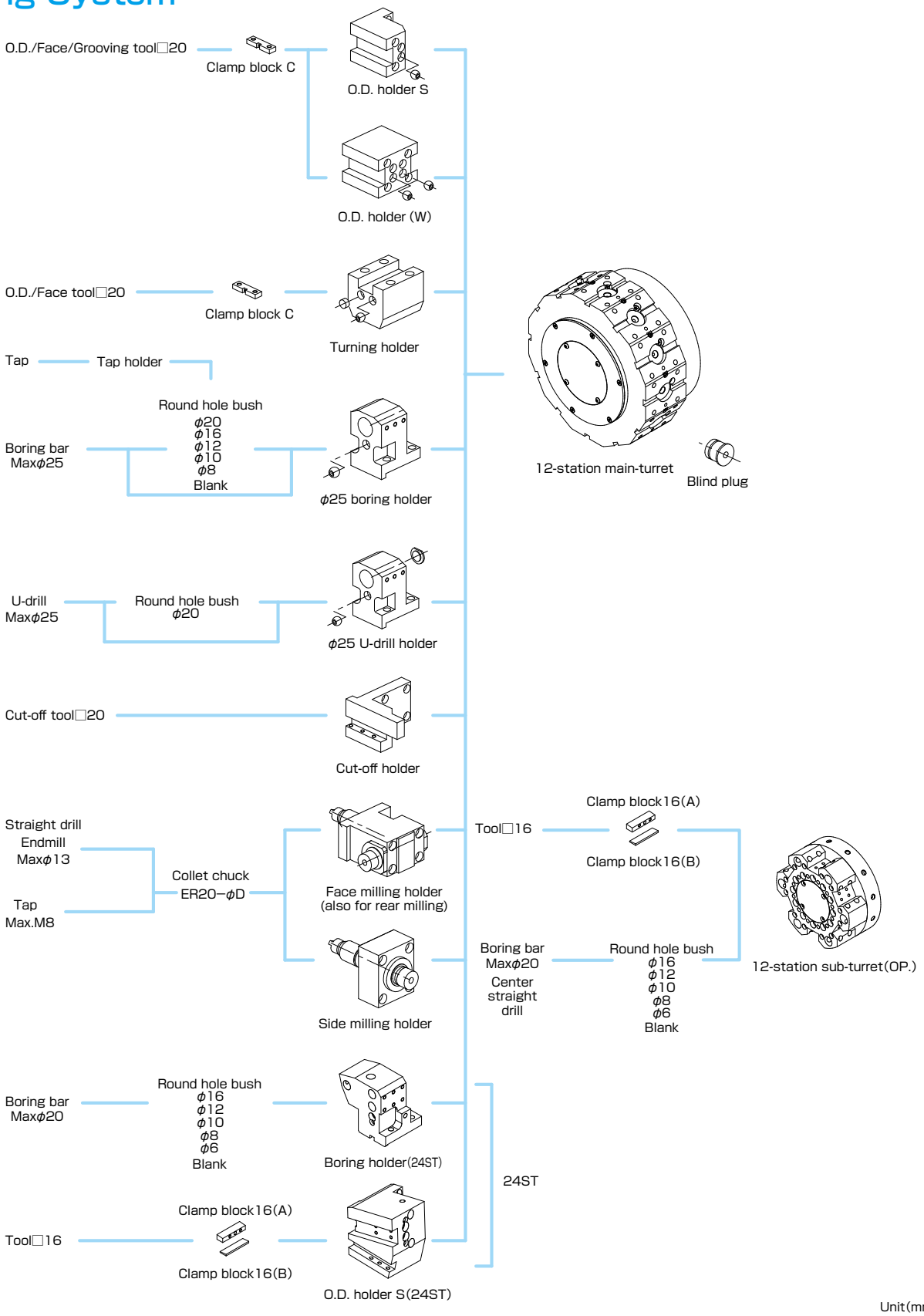
(change in 8 hours)

15μm

Material	S45C	
Spindle speed	Rough 1,600	Finish 2,000 min^{-1}
Cutting speed	Rough 180	Finish 200 m/min
Feed rate	Rough 0.2	Finish 0.08 mm/rev.
Depth of cut	Rough 2.0	Finish 0.1 mm

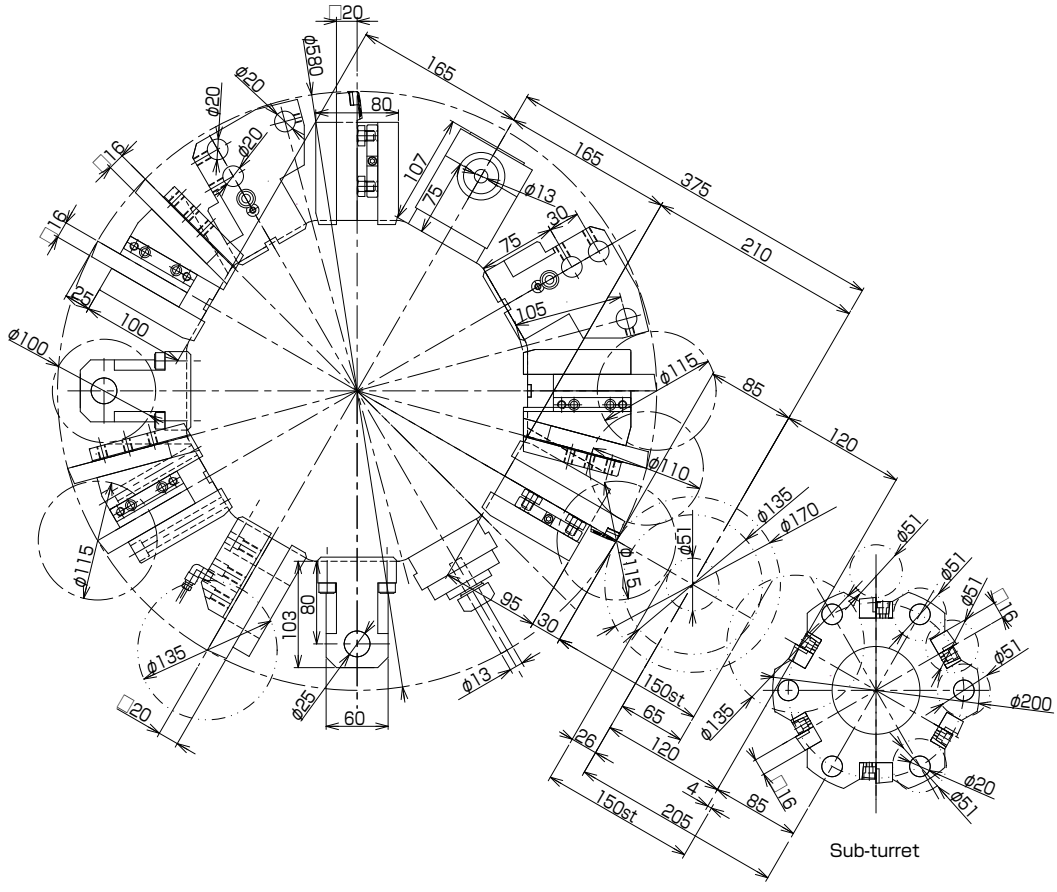


Tooling System



Unit(mm)

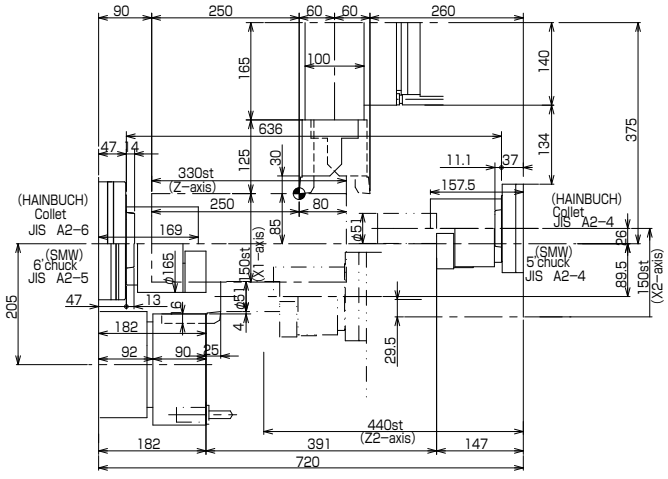
Turret interference



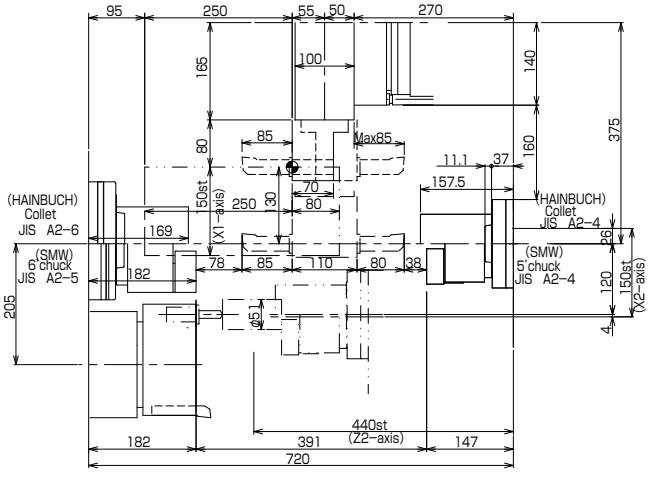
Unit(mm)

Stroke-Related Drawing

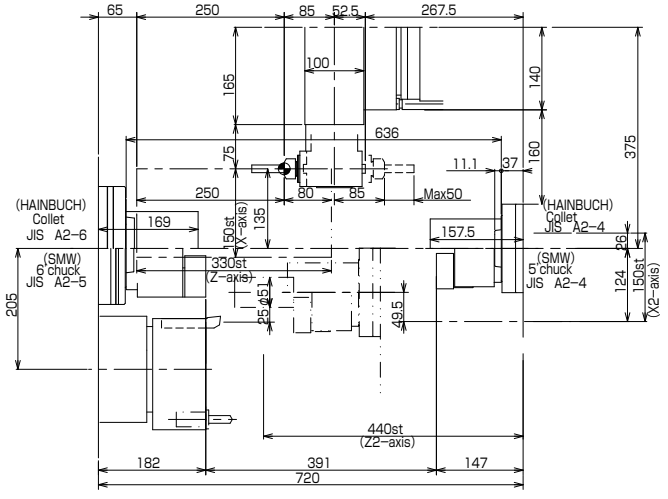
Turning holder



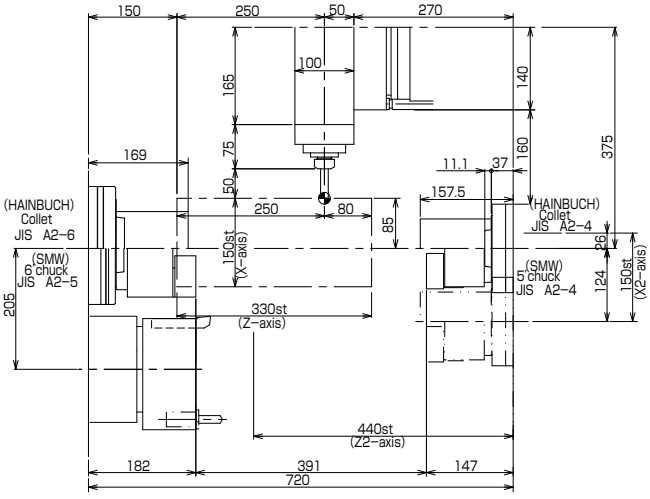
Boring holder



Z-Axis (Face) milling holder

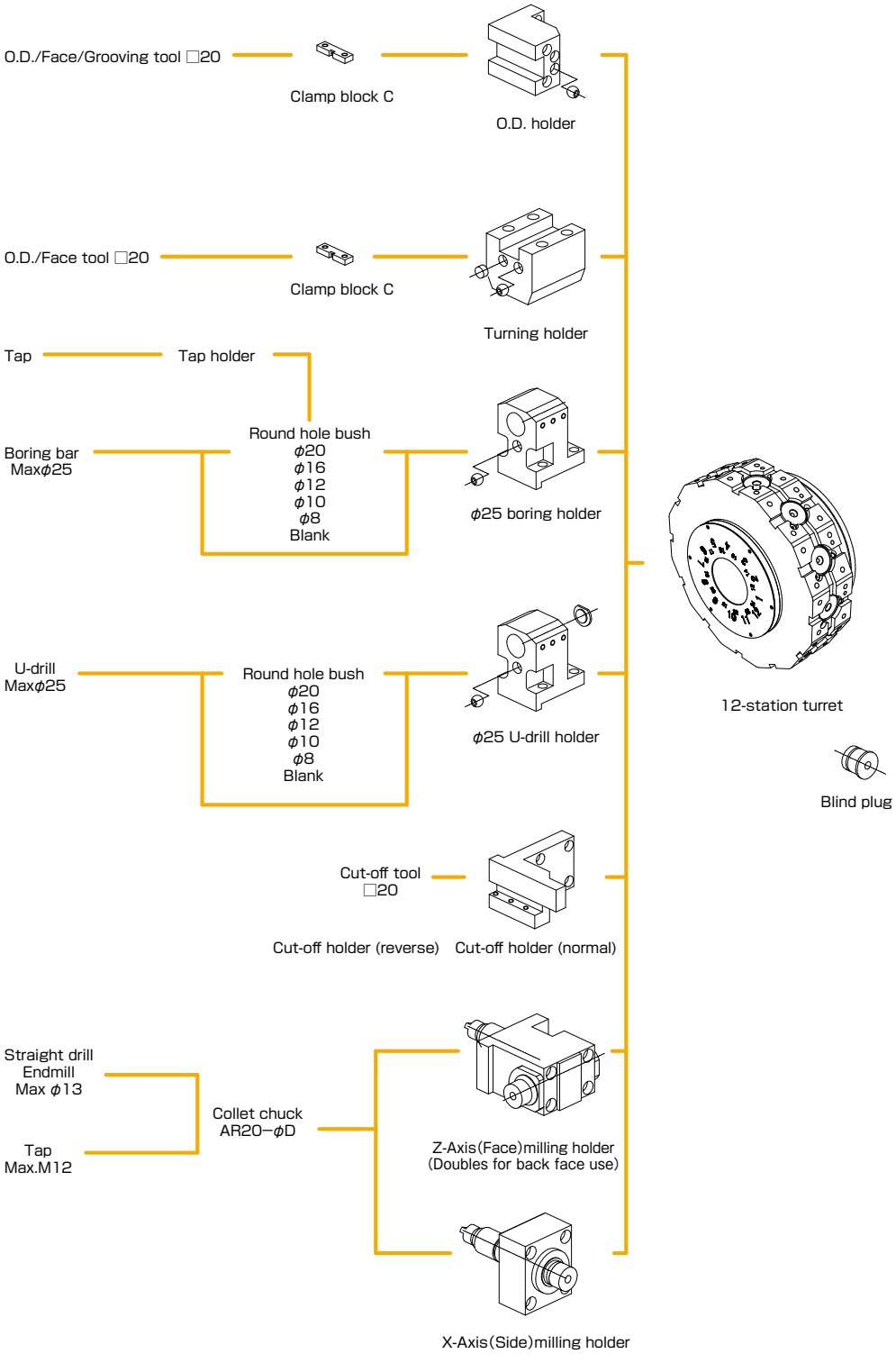


X-Axis (Side) milling holder



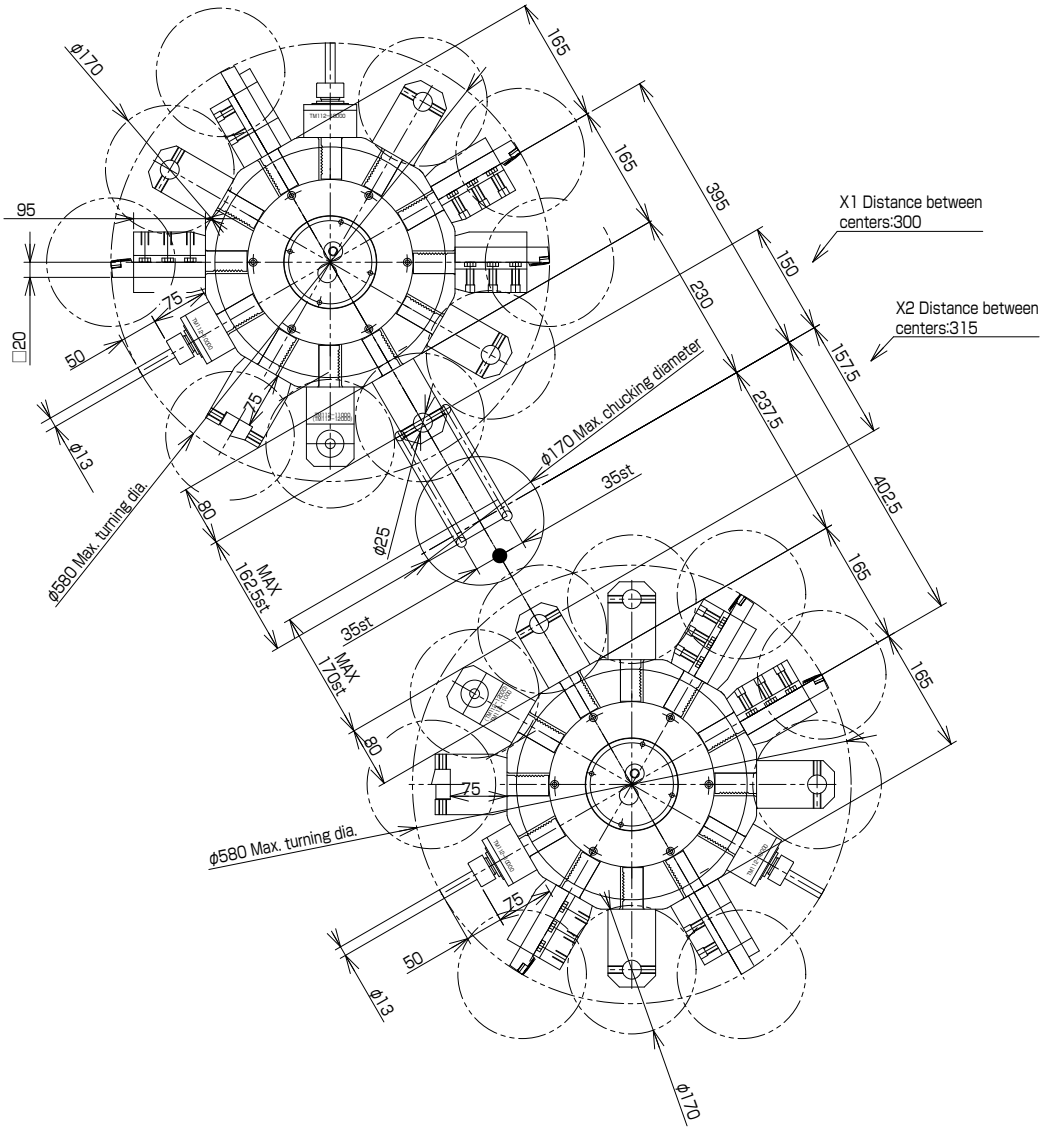
Unit(mm)

Tooling System



単位(mm)

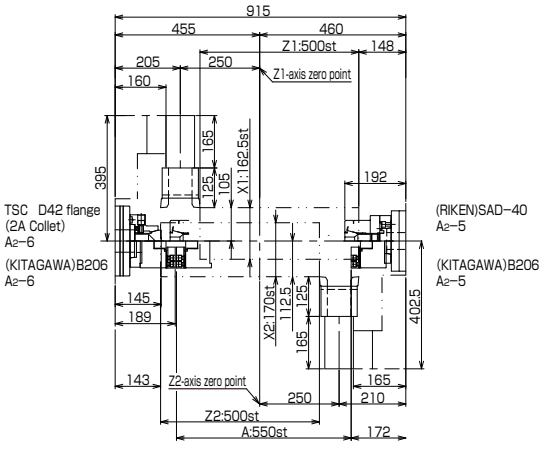
Turret interference



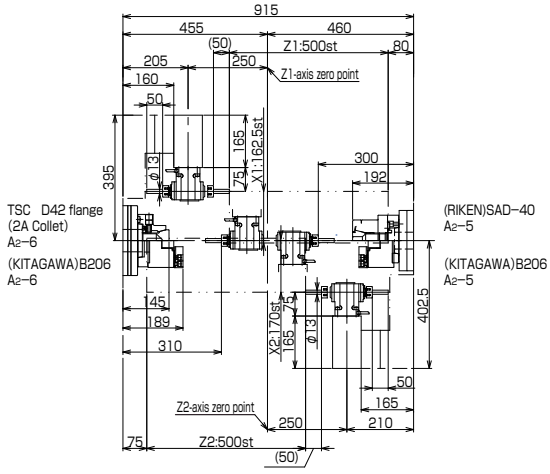
単位(mm)

Stroke-Related Drawing

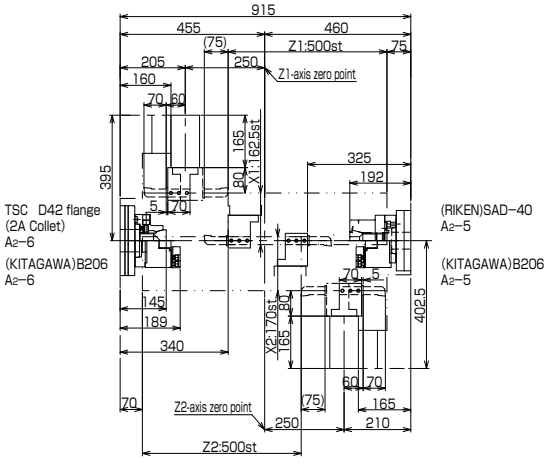
O.D. holder



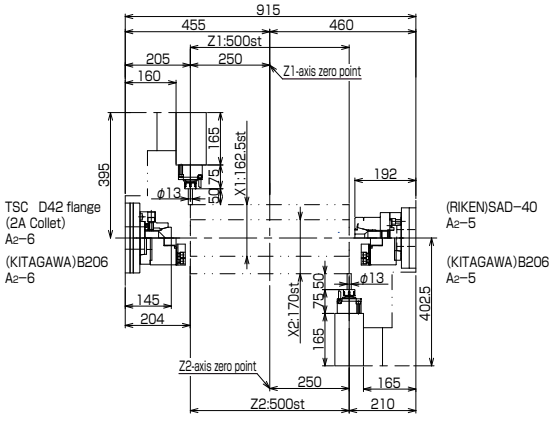
Z-Axis (Face) milling holder



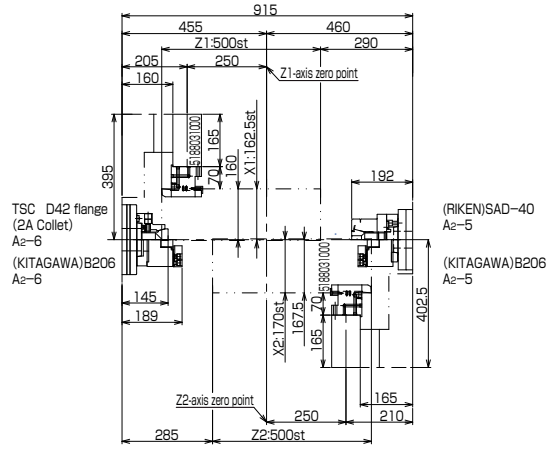
Boring holder, U-drill holder



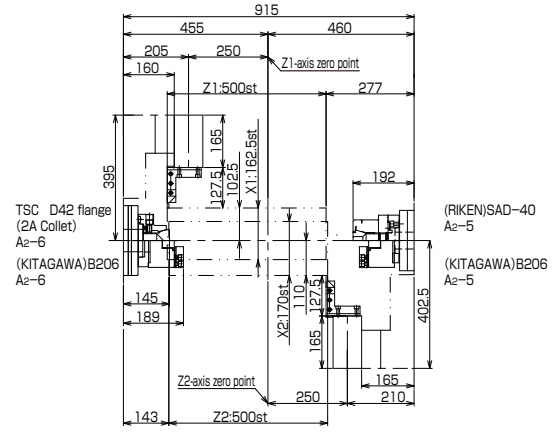
X-Axis (Side) milling holder



Turning holder

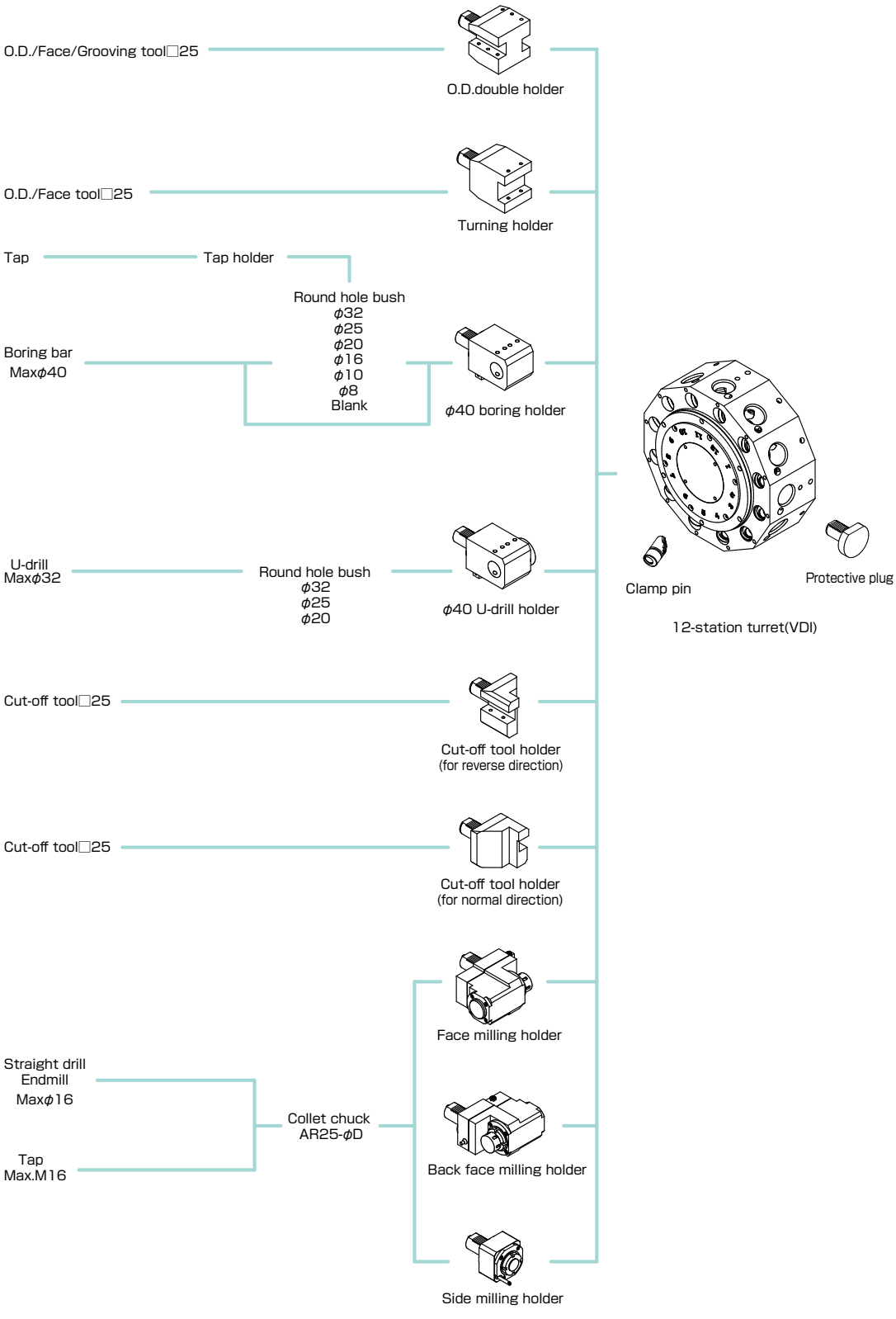


Cut-off holder



Unit(mm)

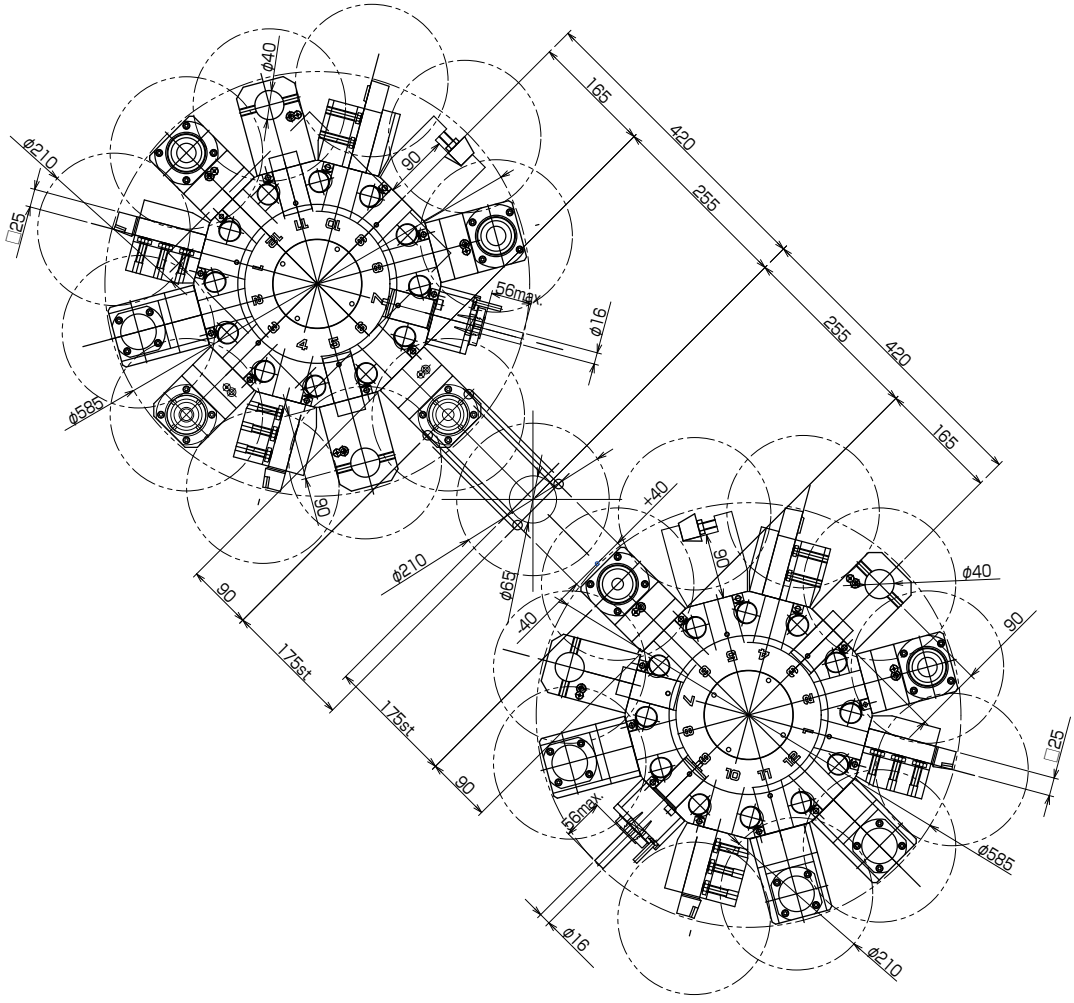
Tooling System [VDI]



Unit(mm)

Turret interference

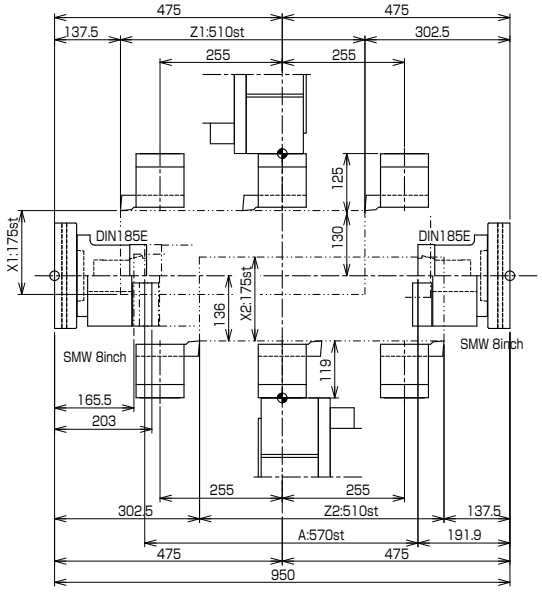
VDI40 turret



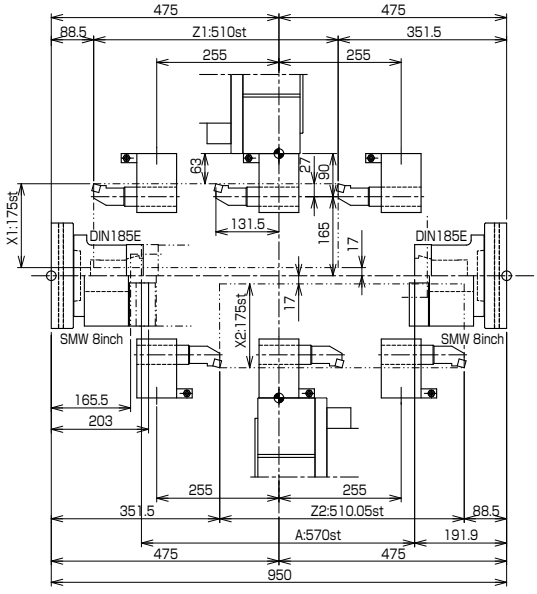
Unit(mm)

Stroke-Related Drawing

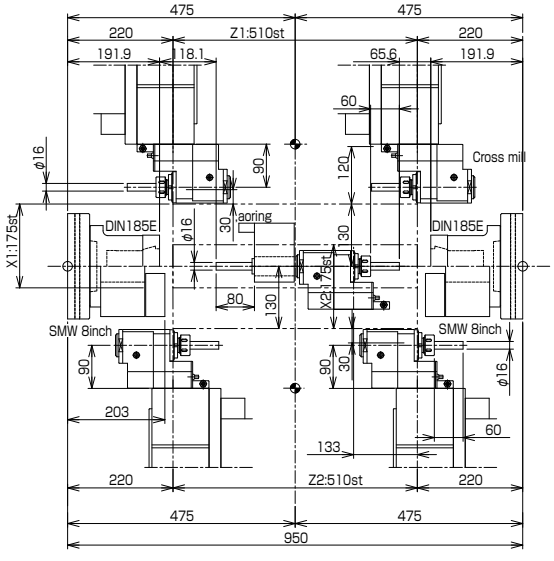
Turning holder



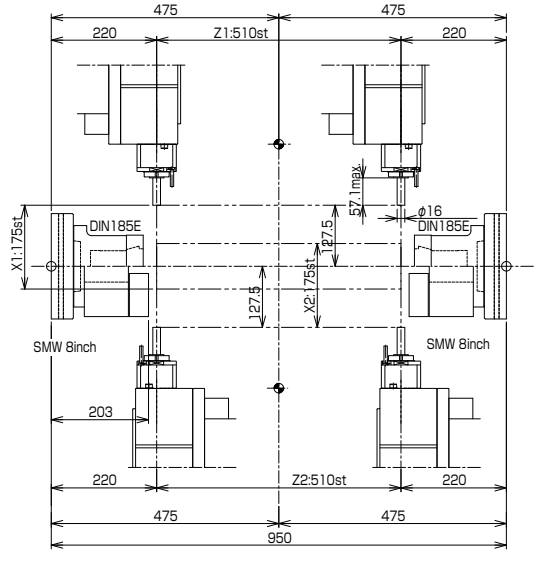
Boring holder



Z-Axis (Face) milling holder



X-Axis (Side) milling holder



Unit(mm)

Machine Specifications

	Item	Unit	XY-120/PLUS Main-spindle	XY-120/PLUS Sub-spindle	XYT-51 Main-spindle	XYT-51 Sub-spindle	XY-2000/PLUS #1 Spindle	XY-2000/PLUS #2 Spindle
Capacity	Max. turning diameter	mm	φ170	φ135	φ190		φ240	
	Max. turning length	mm	330		150 (440 : One-side operation)		160 (445 : One-side operation)	
	Max. bar diameter	mm	φ42 (φ51)	φ20	φ51	φ42	φ51 (φ65)	φ51
	Chuck size	Inch	Collet, 6	Collet, 5	Collet, 6		8	
Spindle	Spindle nose	JIS	A2-5 (A2-6)	A2-4	A2-6	A2-5	A2-6 (A2-8)	A2-6
	Spindle bearing I.D.	mm	φ85 (φ100)	φ65	φ100	φ85	φ100 (φ120)	φ100
	Through-hole on spindle	mm	φ52 (φ61)	φ36	φ52	φ43	φ51 (φ65)	φ51
	Spindle speed	min^{-1}	Max.5,000 (Max.4,000)	Max.5,000	Max.5,000		Max.4,000	
Tool post	Type		12-station turret 24st.		12-station turret 24st.		12-station turret (VDI : 40)	
	Tool shank	mm	□20		□20		□25 (VDI : 40)	
	Boring holder I.D.	mm	φ25		φ25		φ40 (VDI : 40)	
	Max. stroke	mm	X1: 150 Z1: 330 Y: ±35 X2: 150 Z2: 440		X1: 162.5 Z1: 500 Y: ±35 X2: 170 Z2: 500 A: 550		X1 : 175 Z1 : 510 Y : ±40 A : 570 X2 : 175 Z2 : 510	
	Rapid traverse rate	m/min	X1: 18 Z1: 24 Y: 12 X2: 18 Z2: 18		X1: 18 Z1: 30 Y: 12 X2: 18 Z2: 30 A: 30		X1 : 18 Z1 : 24 Y : 12 A : 30 X2 : 18 Z2 : 24	
Power tools	Tool storage capacity	pcs.	12		12 (One side)		12 (One side)	
	Rotation speed	min^{-1}	Max.4,000		Max.4,000		Max.4,000	
	Capacity Drill	mm	φ13		φ13		φ16	
	Capacity Endmill	mm	φ13		φ13		φ16	
	Capacity Tap	mm	M8		M12		M16	
Cs-axis	Rapid traverse rate	deg/min	21,600		24,000		24,000	
	C axis motor	kW	Cs-axis		AC 0.75		AC 0.75	
Motors	Spindle motor	kW	AC7.5/5.5 (AC11/7.5)	AC5.5/3.7	AC18.5/15/11	AC9/7.5/5.5	AC18.5/15	AC11/7.5
	Feed motor	kW	X1: AC1.2 Z1: AC1.8 Y: AC 0.75 X2: AC 0.75 Z2: AC1.2		X1: AC1.8 Z1: AC 1.8 Y: AC1.4 X2: AC1.8 Z2: AC1.8 A: AC1.2		X1 : AC2.5 Z1 : AC2.7 Y : AC2.5 A : AC2.7 X2 : AC2.7 Z2 : AC2.7	
	Coolant motor	kW	AC 0.25/0.25		AC 0.339		AC 0.339	
	Hydraulic motor	kW	AC1.5		AC 0.75		AC 0.75/0.75	
	Power tools motor	kW	AC3.7/2.2/1.5		AC3.7/2.2		AC3.7/2.2	
Size	Spindle center height	mm	1,050		1,240		1,220	
	L×W×H	mm	2,630 × 1,950 × 1,730		2,995×2,250×2,100		3,060×2,145×2,220	
	Machine weight	kg	4,500		7,400		8,100	
Total electric capacity		KVA	27(31)		44		73	

( ) : Option

Standard Accessories

	XY-120/PLUS	XYT-51	XY-2000/PLUS
□Boring holder	2 sets		4 sets
□O.D. holder	2 sets		4 sets
□Cut-off holder	1 set		
□Collet flange	1 set ea. (Main, Sub)		—
□Hydraulic chuck	Option		1set ea. (#1, #2)
□Hydraulic chucking cylinder	—	1 set ea. (Main, Sub)	—
□Y-axis function	1 set (Main)	1 set (#1 Turret)	
□Spindle indexing device	Cs-axis 1 set ea. (Main, Sub)	Cs-axis 1 set ea. (Main, Sub)	C-axis 1 set ea. (#1, #2)
□Power tools drive unit	1 set (Main)	1 set (For both turrets)	
□Sub-spindle	1 set		
□Coolant unit	1 set (200lit.)	1 set (360lit.)	1 set (405lit.)
□Service tool kit	1 set		
□TAKAMAZ Instruction manual	1 set		

Optional Accessories

	XY-120/PLUS	XYT-51	XY-2000/PLUS
□Tool holders		○	
□Stroke adjusting cylinder		○	
□Collet chucks	○		—
□Hydraulic chucks	○(Main : 6 Inch Sub : 5 Inch)	○	
□Chuck clamp detector	○	(Standard)	○
□Sub-spindle parts ejector	○	(Standard)	○
□VDI 12-station turret	—		○
□Sub turret (□16, φ20)	○(12-station)	—	
□TAKAMAZ loader system	○	—	
□Bar feeder system		○	
□Unloader unit (Out-conveyor)	○	(Standard)	○
□Work set detector		○	
□Cut-off check device		○	
□Power tools (Face / Side milling)	○	—	○
□Chip conveyor (Floor type/Spiral type)		○(Right)	
□Air blow unit (Front)		○	
□Air blow unit (Rear)	○	—	○
□Rear coolant unit		○	
□Signal light (1-tier / 2-tier / 3-tier)		○	
□Automatic fire extinguisher		○	
□Automatic power shut-off device		○	
□Automatic door system	○	—	○
□Special color		○	
□Others※		○	

※For more information on attachments, consult our sales representative.

Controller Specifications

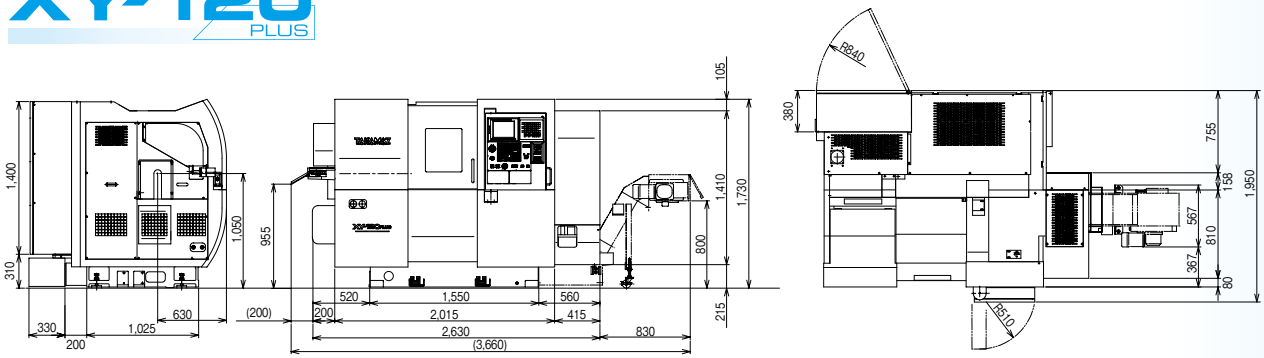
Item	XY-120/PLUS	XYT-51	XY-2000/PLUS
	TAKAMAZ&FANUC 0i-TD	TAKAMAZ & FANUC 32i-B	TAKAMAZ & FANUC 31i-A
Controlled axes	7 axes (X1, Z1, C1, Y, X2, Z2, C2)	8 axes (X1, Z1, C1, Y, X2, Z2, C2, A)	
Simultaneously controllable axes	Simultaneous 4 axes		
Least input increment	0.001mm (X in diameter)		
Least command increment	X: 0.0005mm Z, Y: 0.001mm	X: 0.0005mm Z, Y, A: 0.001mm C: 0.001deg.	
Auxiliary function	M3 digits		
Spindle function	S4 digits		
Tool function	T4 digits		
Tape code	EIA(RS232C) / ISO(840)automatic recognition		
Cutting feedrate	1 ~ 5,000mm/min	1 ~ 7,000mm/min	1 ~ 5,000mm/min
Command system	Incremental / Absolute		
Linear interpolation	G01		
Circular interpolation	G02, G03		
Cutting feedrate override	0 ~ 150%		
Rapid traverse override	F0, 100%	F0, 25%, 50%, 100%	F0, 50, 100%
Program number	4 digits	Program file name 32 characters	
Backlash compensation	0 ~ 9,999μm		
Program memory capacity	1Mbyte (2,560m) (Dual systems total)	64Kbyte(160m) (Dual systems total)	
Tool offsets	128 sets(Dual systems total)	99 sets (Dual systems total)	32 sets (Dual systems total)
Registered programs	800 pcs.(Dual systems total)	63 pcs. (Dual systems total)	
Tool geometry / Wear offset	Standard		
Canned cycle	G90, G92, G94		
Radius designation on arc	Standard		
Tool offset measurement input	Standard		
Background editing	Standard		
Direct drawing dimension programming	Standard	Option	
Custom macro	Standard		
Additional custom macro common variables	#100 ~#199, #500 ~#999	Option	
Pattern data input	Standard	—	
Nose R compensation	G40, G41, G42		
Inch / Metric conversion	G20 / G21	Option	
Programmable data input	G10		
Run hour / Parts count display	Standard	Option	
Extended part program editing	Standard		
Multiple repetitive cycle	G70 ~ G76		
Multiple repetitive cycleII	Pocket-shaped	Option	
Spindle synchronous control	Standard		
Sub-spindle torque skip	Standard		
Y-axis offset	Standard		
Canned drilling cycle	Standard		
Constant surface speed control	G96, G97		
Continuous thread cutting	G32		
Variable lead thread cutting	G34	Option	
Thread cutting retract	Standard	Option	—
Clock function	Standard		
Help function	Standard		
Alarm history display	50 pcs.		60 pcs.
Self-diagnosis function	Standard		
Self-diagnosis function	Up to 10 loops		
Decimal point input	Standard		
2nd reference point return	G30		
Work coordinate system setting	G50, G54 ~ G59		
Rigid tapping	For Power Tool only		
Polar coordinate interpolation	Standard		
Cylindrical interpolation	Standard		
Stored stroke check 1	Standard		
Stored stroke check 2,3	Standard		
Input / Output interface	USB Flash Memory, Memory card, Ethernet		RS232C, Memory card, Ethernet
Alarm message	Standard		
Graphic display	Standard		
Spindle orientation	Standard		
Conversational programming with graphic function	Standard	—	
Abnormal load detection	Standard		—
Overlap Cutting Process	Standard		—
Balance cut	—	G68, 69	
Manual handle trace	Standard		—
Automatic data backup	Max.3		—
Automatic screen deletion function	Standard		
TAKAMAZ management support function	Work / Tool counter, Tool load monitor, Others		
TAKAMAZ maintenance function	Standard		
FANUC set of manuals	CD-ROM	DVD-ROM	Bound

Optional Specifications

Item	XY-120/PLUS	XYT-51	XY-2000/PLUS
	TAKAMAZ&FANUC 0i-TD	TAKAMAZ & FANUC 32i-B	TAKAMAZ & FANUC 31i-A
Tool life management			
Multiple M codes in one block	Max. 3		
Dynamic graphic display※			—
Manual guide i※			
Helical interpolation			
RS232C			(Standard)
FANUC instruction manuals	Bound		(Standard)

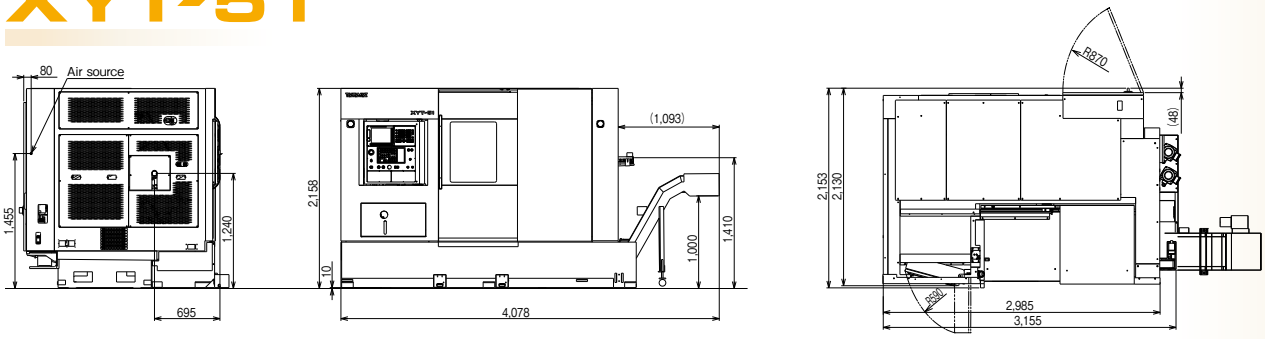
※These cannot be used together.

XY-120 PLUS



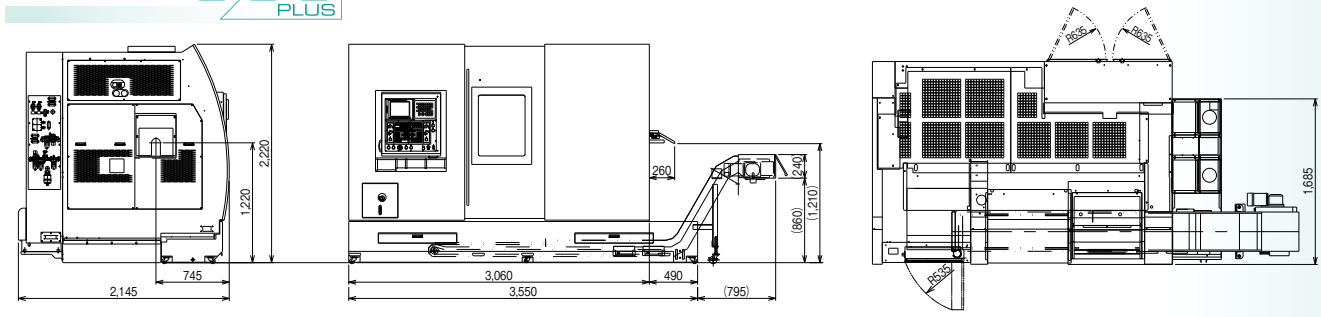
Unit(mm)

XYT-51



Unit(mm)

XY-2000 PLUS



Unit(mm)

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