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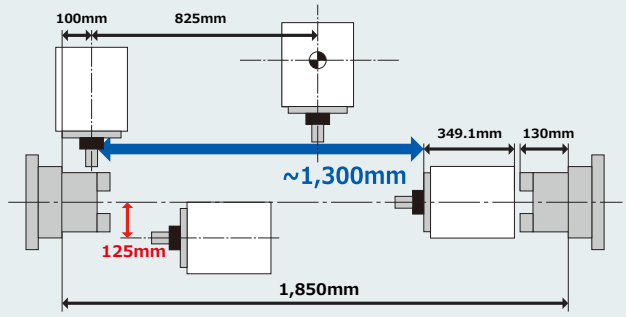
JX-250

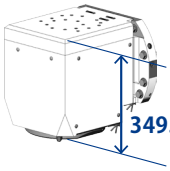
NAKAMURA-TOME
PRECISION INDUSTRY CO.,LTD.

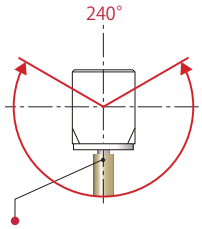
The World's Shortest Tool-Spindle
NT Smart Cube

The world's shortest tool spindle in its class. Thanks to the ultra-compact size of the Tool Spindle, interference is reduced, and a wider machining area is ensured.



■ Tool Spindle (NT Smart Cube)





Max. tool diameter (without adjacent tool) : φ130mm
Max.tool length : 300mm

Length	*349.1mm*
Tool spindle motor	*22/15kW* *12,000min⁻¹* *20,000min⁻¹(op.)*

■ Bar capacity Φ65 / Φ71mm (op.) / Φ80mm (op.)

L-spindle motor	*15/11kW* *18.5/15kW (op.)* *For φ80, only 18.5/15kW.* *4,500min⁻¹* *3,500min⁻¹(op.)*

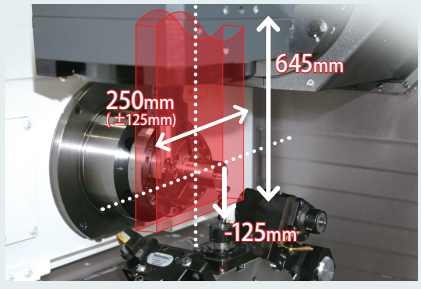
■ Bar capacity Φ65 / Φ71mm (op.)

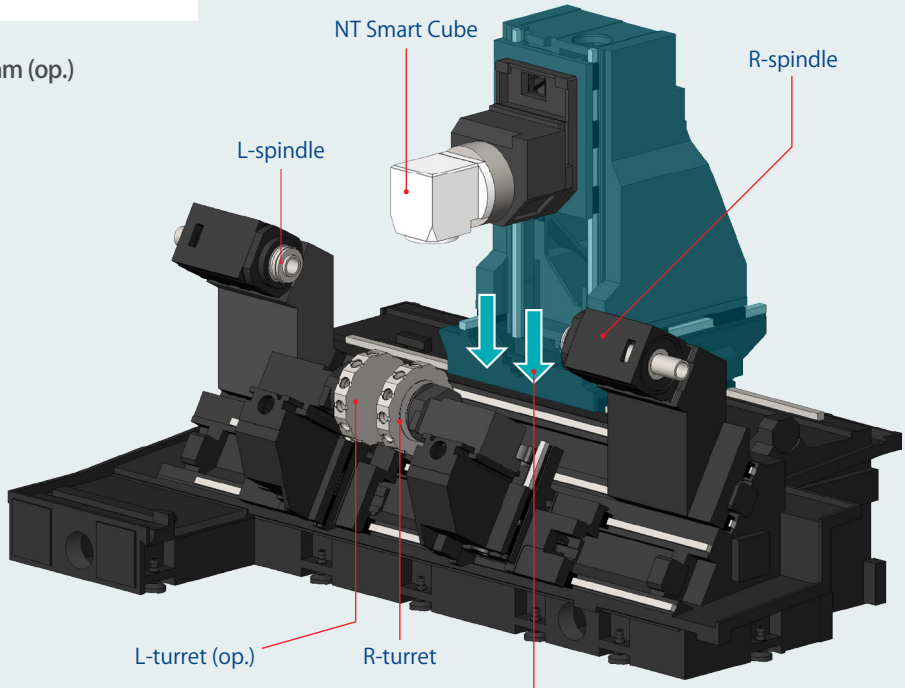
R-spindle motor	*15/11kW* *4,500min⁻¹* *3,500min⁻¹(op.)*

L-lower turret(op.) & R-lower turret

■ Y-axis travel 80mm (±40mm)

Milling spindle motor	*5.5/3.7kW* *6,000min⁻¹*





High accuracy milling

Thanks to large Y-axis travel and 125mm X-axis travel beyond the spindle center, various machining operations can be performed without rotating the C-axis, such as square milling in the X-Y plane or deep hole drilling in the X-axis direction, ensuring faster cycle time and higher precision.

Vertical column structure

Strong and stable structure, where the load is evenly applied.

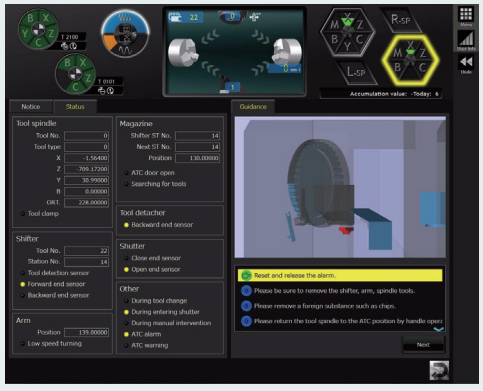
168 stations

Up to 168 tools available !

In addition to 120 qualified ATC Tools for the Tool spindle(Op.), up to 24 × 2 tools can be mounted on the lower turrets.

ATC Maintenance Navigator

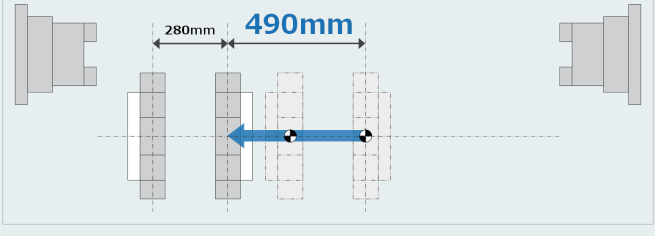
In addition to information about the ATC status and position of the Alarm, the step by step ATC recovery guidance screen, ensure fast ATC recovery and shorter machine down time.



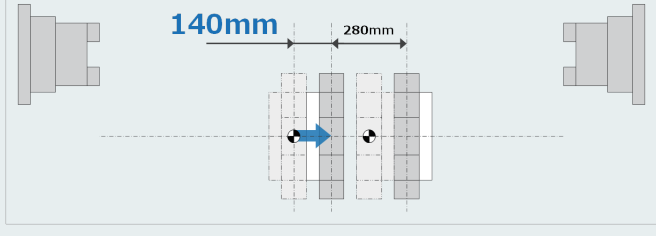
Cross Over Travel for Lower Z-axis (op. L lower turret)

When one turret is retracted in the Z-axis direction, the other turret can advance beyond its Z-Axis reference point, ensuring a larger Z-axis travel. This greatly increases the machining range of the lower turrets.

■ Z2 stroke



■ Z3 stroke



NT Smart X

Full Operator Support from Ease of Use to Reliability.

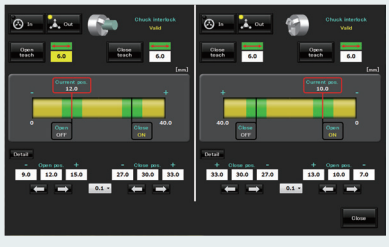
3D Smart PRO
Original Menu screen
Voice Guidance
Multiple-Touch screen
Windows 8.1

- 19 inch color LCD touch panel
- PC memory 8 GB
- QWERTY keyboard
- Windows 8.1
- Touch pad
- USB 2.0 Port × 2

Main features of NT SmartX

Standard

- NT Work Navigator
- Airbag (Overload detection)
- NT Nurse function
- Status Display Function
- Setup Display
- Trouble Guidance
- Productivity Function
- Warm up Function
- Tool spindle loading Operation function
- Parts Catcher G Operation Function
- NT Machine Simulation
- NT Collision Guard
- NT Multitasking Office (op.)
- NT Thermo Navigator AI
- NT Smart Sign
- Digital Chuck interlock
- One touch MDI function



Digital Chuck Interlock

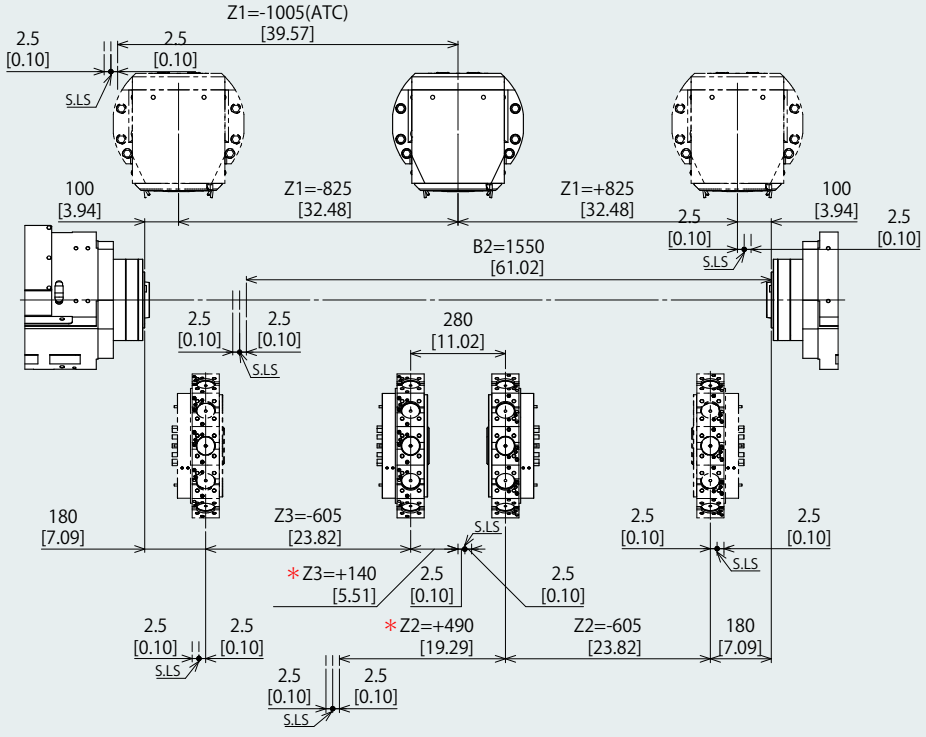
Set the detection position of open end and closed end of chuck arbitrarily.
The chuck open / close position is set on the NT Smart X screen.
Setup time and machining cycle time are reduced.

One Touch MDI

This function is to register in advance frequently used cycle programs such as home position return and tool exchange, and call with one touch.

Reduce programming and setup time, while eliminating input errors.

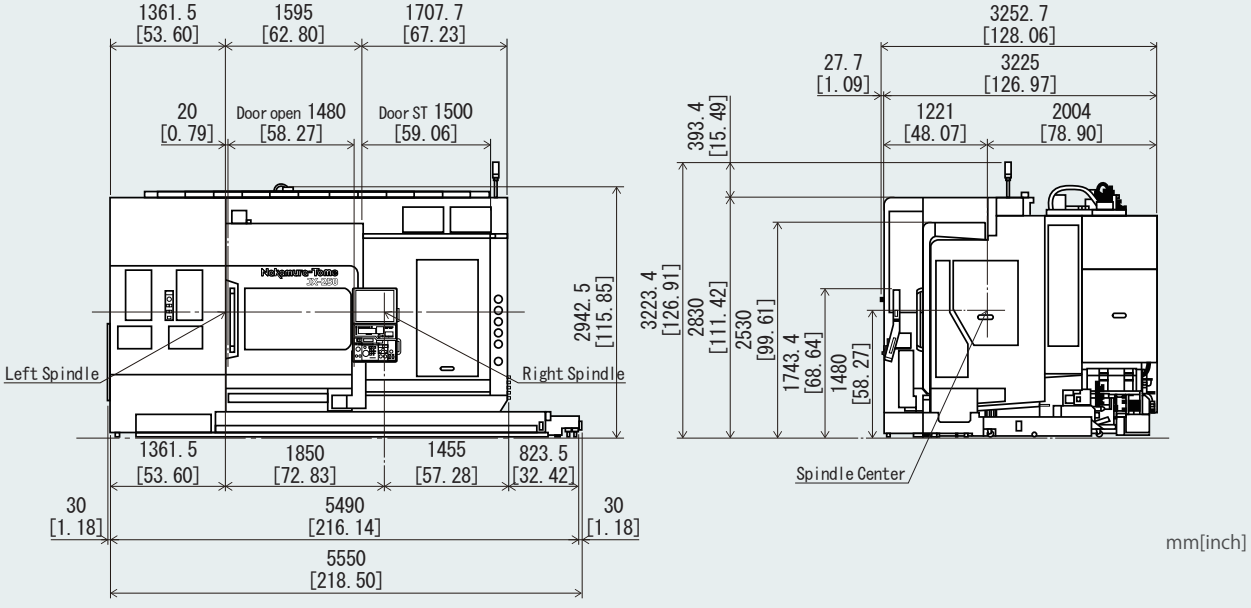
Travel Range



mm[inch]

* Cross over travel

Floor Space



mm[inch]

JX-250

■ Capacity

Max. turning diameter	320mm
Distance between spindles	max.1,850mm / min.300mm
Max.turning length	1,650mm
Bar capacity	φ65mm / φ71mm(op.) / φ80mm(op. Only L)
Chuck size	8"

■ Axis travel

Slide travel X1	645mm
Slide travel X2 / X3(op.)	215mm / 215mm *For φ80, X3 stroke is limited.
Slide travel Z1	±825mm (at ATC+1,005mm)
Slide travel Z2 / Z3(op.)	1,490mm(Without Z3), 1,095mm(With Z3) / 745mm
Slide travel Y1	±125mm
Slide travel Y2 / Y3(op.)	±40mm / ±40mm
Slide travel B2	1,550mm

■ Left spindle	φ65	φ71(op.)	φ80(op.)
Spindle speed	4,500min^{-1}	3,500min^{-1}	3,500min^{-1}
Spindle speed range	Stepless	Stepless	Stepless
Spindle nose	A2-6	A2-6	A2-8
Hole through spindle	80mm	80mm	100mm
I.D. of front bearing	120mm	120mm	-
Hole through draw tube	66mm	72mm	81mm

■ Right spindle	φ65	φ71(op.)	
Spindle speed	4,500min^{-1}	3,500min^{-1}	-
Spindle speed range	Stepless	Stepless	-
Spindle nose	A2-6	A2-6	-
Hole through spindle	80mm	80mm	-
I.D. of front bearing	120mm	120mm	-
Hole through draw tube	66mm	72mm	-

■ ATC Tool spindle

Tool spindle speed	12,000min^{-1} / 20,000min^{-1} (op.)
Swiveling range	240° (±120°)
Tool shank type	CAPTO C6 / HSK-A63(op.)
Number of tools	80, (40, 120 op.)
max. tool diameter / without adjacent tool	90mm / 130mm
max. tool length	300mm

● Safety quality specifications

Various interlocks, such safety fences, auto extinguisher devices, and other safety related equipment may be required. These have to be selected during the configuration of the machine.

① Safety devices include electromagnetic door lock, chuck interlock, hydraulic pressure switch, air pressure switch, short circuit breaker and quill interlock. (Door interlock and chuck interlock are standard equipment.)

② In case of automation, various safety fences may be required, such as work stocker safety fences, robot safety fences, ...etc.

During the configuration of machine specifications, please discuss these requirements with the Nakamura-Tome machine sales representative.

● Precautions on the use of cutting fluids and lubricating oils

◦ Some types of cutting fluids (coolant) are harmful to machine components, causing damages such as peeling of paint, cracking of resin, expanding of rubber, corrosion and rust build up on aluminum and copper.
To avoid causing damage to the machine, never use synthetic coolants, or any coolants containing chlorine. In addition, never use coolants and lubricating oils which contain organic solvents such as butane, pentane, hexane and octane.

◦ Machine warranty terms are void for any claims or damage arising from the use of inappropriate cutting fluids or lubricating oils.

■ R-lower turret

Type of turret head	Dodecagonal drum turret
Number of tool stations	12 (Max.24)
Number of Indexing positions	24
Tool size (square shank)	□25mm
Tool size (round shank)	φ32mm

■ Milling : R-lower turret

Rotary system	Individual rotation	
Milling spindle speed	6,000min^{-1}	
Spindle speed range	Stepless	
Number of milling stations	12	
Tool size	Straight holder	φ1mm ～φ16mm
	Cross holder	φ1mm ～φ16mm

■ L-lower turret (op.)

Type of turret head	Dodecagonal drum turret
Number of tool stations	12 (Max.24)
Number of Indexing positions	24
Tool size (square shank)	□25mm
Tool size (round shank)	φ32mm

■ Milling : L-lower turret (op.)

Rotary system	Individual rotation	
Milling spindle speed	6,000min^{-1}	
Spindle speed range	Stepless	
Number of milling stations	12	
Tool size	Straight holder	φ1mm ～φ16mm
	Cross holder	φ1mm ～φ16mm

■ Drive motor

L-spindle	15/11kW / 18.5/15kW(op.) *For φ80, only 18.5/15kW.
R-spindle	15/11kW
Tool Spindle	22/15kW
Milling (Lower turret)	5.5/3.7kW

■ General

Height	2,942.5mm
Floor space (L x W)	5,580mm ×3,252.7mm
Machine weight (incl. control)	25,000kg

■ Power requirements

Power supply	Without L-lower turret	65.7 (69.8)kVA (L-spindle 15/11kW,R-spindle 15/11kW)
		69.3 (73.3)kVA (L-spindle18.5/15kW,R-spindle 15/11kW)
	With L-lower turret	70.7 (75.8)kVA (L-spindle 15/11kW,R-spindle 15/11kW)
		74.3 (79.4)kVA (L-spindle 18.5/15kW,R-spindle 15/11kW)

Machine• Control Specification

■ Items

Control Type	Without L-lower turret	FANUC 31i-B5 (2-PATH)
	With L-lower turret	FANUC 31i-B5 (3-PATH)

■ Controlled axes

Controlled axes	Without L-lower turret	10 axes	
	With L-lower turret	14 axes	
Simul-taneously Controlled axes	Without L-lower turret	Upper	5axes(X1, Z1, C1(C2), Y1, B1axis)
		R-lower turret	4axes(X2, Z2, C2(C1), Y2, B2axis)
	With L-lower turret	Upper	5axes(X1, Z1, C1(C2), Y1, B1axis)
		R-lower turret	4axes(X2, Z2, C2, Y2, B2axis)
		L-lower turret	4axes(X3, Z3, C1, Y3axis)

■ Input command

Least input increment	X,Z,Y,B2：0.001mm/0.0001inch (diameter for X-axis) / C,B1：0.001°
Least command increment	X：0.0005mm / Z,Y,B2：0.001mm / C,B1：0.001°
Max. programmable dimension	±999999.999mm / ±39370.0787in , ±999999.999°
Absolute/ incremental programming	X, Z, Y, C, B(absolute only for B) / U, W, V, H
Decimal input	Standard
Inch / Metric conversion	G20 / G21
Programmable data input	G10

■ Feed function

Cutting feed	feed/min X, Z: 1～8000mm/min, 0.01～315inch/min (1～4800mm/min, 0.01～188inch/min) Y: 1～8000mm/min, 0.01～315inch/min (1～4800mm/min, 0.01～188inch/min) C: 1～4800°/min B1: 1～8000°/min (1～4800°/min) B2: 1～8000mm/min, 0.01～315inch/min (1～4800mm/min, 0.01～188inch/min) feed / rev 0.0001～8000.0000mm/rev (0.0001～4800.0000mm/rev) 0.000001～50.000000inch/rev The maximum cutting feed rate is the value in AI contour control mode. Can be turned on with G316 command. The values in parentheses are normal values.
Dwell	G04
Feed per minute / Feed per revolution	G98 / G99
Thread cutting	G32F designation
Thread cutting retract	Standard
Continuous thread cutting	Standard
Handle feed	Manual pulse generator 0.001/0.01/0.1mm (per pulse)
Automatic acceleration / decelaration	Standard
Linear accel./ decel. After cutting feed interpolation	Standard
Rapid feed override	Low /25/50/100% (changeable to every 10% by NT Setting screen)
Cutting feedrate override	0～150%, 10% (each 10%)
AI contouring control I	G5.1
L- Spindle override	50%～120% Set every 10%
R-Spindle override	50%～120% Set every 10%
Tool Spindle override	50%～120% Set every 10%

■ Program memory

Part program storage length	Without L-lower turret	1Mbyte Total 2560m (Upper / Lower：Each 1280m) 2Mbyte Total 5120m (op.) 4Mbyte Total 10240m (op.) 8Mbyte Total 20480m (op.)
	With L-lower turret	2Mbyte Total 5120m (Upper / R-Lower / L-Lower：Each 1706m) 4Mbyte Total 10240m (op.) 8Mbyte Total 20480m (op.)
Parts program editing		delete, insert, change
Program number search		Standard
Sequence number search		Standard
Address search		Standard
Number of registerable programs	Without L-lower turret	Total 2,000 programs (Upper / Lower：Each 1,000 programs) Total 4,000 programs (op.)
	With L-lower turret	Total 4,000 programs (Upper / R-Lower / L-Lower：Each 1,333programs)
Program storage memory		Backed up by battery
Multiple program simultaneous editing		Standard
DNC operation through memory card		Standard (Not including memory card)
Extended part program editing		Standard

■ Operation and display

HMI (Human Machine Interface)	NT SmartX
Operation panel : Display	19" color SXGA LCD touch panel
Operation panel : Keyboard	QWERTY keyboard

■ Programming assist function

Circular interpolation R programming	Standard
Direct drawing dimension pro-gramming or Chamfering/Corner R	Standard (Direct drawing dimension programming is standard)
Canned cycle	G90, G92, G94
Multiple repetitive canned cycle	G70～G76
Multiple repetitive canned cycle II	G71, G72
Canned cycle for drilling	G80～G89
Sub program	Standard
Custom macro	Standard (common variable#100 - #149, #500 - #549)
Additional customer macro variables	Standard (After addition, #100 - #199, #500 - #999)
Luck-bei II / NT Manual Guide i	Standard
Abnormal load detection function	Standard
NT Work Navigator	Standard (not including contact bar)
NT NURSE	Standard

■ Mechanical support

Rigid tap	Standard
Spindle synchronised control	Standard
C axis synchronised control	Standard (G496 C1, fast forward positioning)
Spindle orientation	Standard
Tool spindle orientation	Standard : 4 positions (90°×4) (M785/ M786/ M787/ M788)
	Maximum : 12 positions (12×30°) (G419)

■ ECO function

Servo motor power off	Standard（changeable by NT Setting screen）
Motor acceleration / deceleration output limit	Standard（changeable by NT Setting screen）
Servo motor energy saving acceleration / deceleration G code	G356/G357
Automatic lighting off	Standard（changeable by NT Setting screen）
Automatic monitor off	Standard（changeable by NT Setting screen）