JX-250

NAKAMURA-TOME
PRECISION INDUSTRY CO.,LTD.

Multitasking machine with ATC,
Tool spindle and twin-turrets

In pursuit of
genuine Multitasking

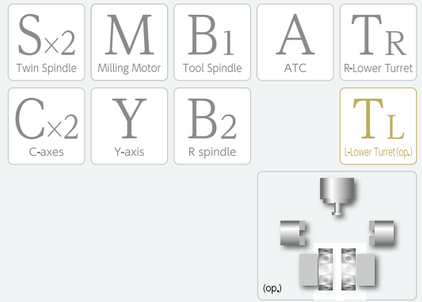
Innovative
Technology
～Creating new values～

JX-250

State of the art Tool Spindle Multitasking machine,
with ATC, 2 Lower Turrets* and Y-axis(std.).
Featuring a wide variety of software and "Smart Cube",
the world's most compact Tool Spindle in its class.
This machine is the answer to the most complex
machining needs.

※ L side turret (op.)

- "NT Smart Cube" is the World's Shortest Tool-Spindle in its class
- ATC tool spindle motor 22/15kW
  Tool spindle speed 12,000min^{-1} (op. 18,000min^{-1})
- Number of tools 80 (op. 40,120)
- X-axis travel below spindle center is 125mm
  Y-axis travel is +/-125mm from the spindle center
- Milling and Y axis are standard on the left and right side lower turrets (left side lower turret is op.)
  The two-turret machine features a lower Z-axis cross-over stroke (R：490mm, L：140mm), responding to a wider machining range, especially for longer parts
- 5.5/3.7kW milling motor on the lower turret
  Rotation speed 6,000min^{-1}
- Floor space 5,578.5mm × 3,257.7mm
  (including standard coolant tank)
- Large variety of software



Having the world's most compact tool spindle in its class, this machine is featuring phenomenal machining capabilities

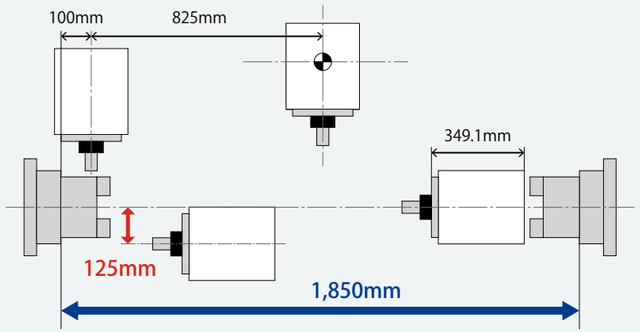
With NT Smart Cube, the world's most compact tool spindle in its class, this machine was developed to make effective use of a wide machining area. Additionally, it is featuring high performance Tool Spindle motors with up to 22/15kW (op.), an ATC with a capacity of up to 120 tools (op.), twin-turrets※ (2nd turret op.) equipped with Y-axis as standard, as well as crossover stroke on the lower Z-axis, which together contribute to unprecedented machining capabilities for a wide range of complex parts.
In addition, the user friendly "NT Thermo Navigator AI" provides accurate thermal compensation, resulting in stable high-accuracy machining.
Nakamura-Tome multitasking machines are not only known for high machining capabilities, but are also known for "high rigidity" and "high precision".
※(L side turret op.)

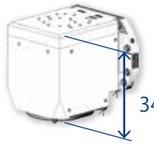
The world's shortest tool spindle in its class*

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.

* Based on our survey in the multitasking machine market

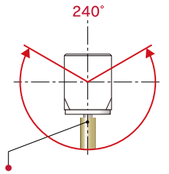




Length	349.1mm*

* The length is 428.6mm in case the tool spindle speed is 18,000min-1

Tool spindle motor	22/15kW
Tool spindle speed	12,000min-1 18,000min-1 (op.)
Y-axis slide travel	±125mm



Max.tool diameter (without adjacent tool)	φ130mm
Max.tool length	300mm 400mm(op.)

Turning

■ Cutting cross section	3.3mm²/rev
■ Depth of cut	6mm
■ Feed	0.55mm/rev
■ Cutting speed	120m/min

The combination of bar capacity and motor is available from following patterns.

Standard		Option		Option	
■ L-spindle	■ R-spindle	■ L-spindle	■ R-spindle	■ L-spindle	■ R-spindle
Bar capacity	Bar capacity	Bar capacity	Bar capacity	Bar capacity	Bar capacity
φ65mm(A2-6)	*φ65mm(A2-6)*	*φ71mm(A2-6)*	*φ65mm(A2-6)*	*φ71mm(A2-6)*	*φ71mm(A2-6)*
Spindle motor	Spindle motor	Spindle motor	Spindle motor	Spindle motor	Spindle motor
18.5/15kW	*18.5/15kW*	*18.5/15kW*	*18.5/15kW*	*18.5/15kW*	*18.5/15kW*

Option		Option		Option	
■ L-spindle	■ R-spindle	■ L-spindle	■ R-spindle	■ L-spindle	■ R-spindle
Bar capacity	Bar capacity	Bar capacity	Bar capacity	Bar capacity	Bar capacity
φ80mm(A2-8)	*φ65mm(A2-6)*	*φ80mm(A2-8)*	*φ65mm(A2-8)*	*φ80mm(A2-8)*	*φ71mm(A2-6)*
Spindle motor	Spindle motor	Spindle motor	Spindle motor	Spindle motor	Spindle motor
22/18.5kW	*18.5/15kW*	*22/18.5kW*	*18.5/15kW* *1	*18.5/15kW*	*15/11kW*

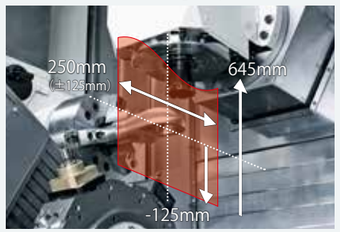
Option		Option	
■ L-spindle	■ R-spindle	■ L-spindle	■ R-spindle
Bar capacity	Bar capacity	Bar capacity	Bar capacity
φ90mm(A2-8)	*φ65mm(A2-6)*	*φ90mm(A2-8)*	*φ65mm(A2-8)*
Spindle motor	Spindle motor	Spindle motor	Spindle motor
22/18.5kW *2	*18.5/15kW*	*22/18.5kW* *2	*18.5/15kW* *1

*1 15" chuck is available.

*2 It is only available for single turret machine.
It is NOT available for gantry loader specifications.

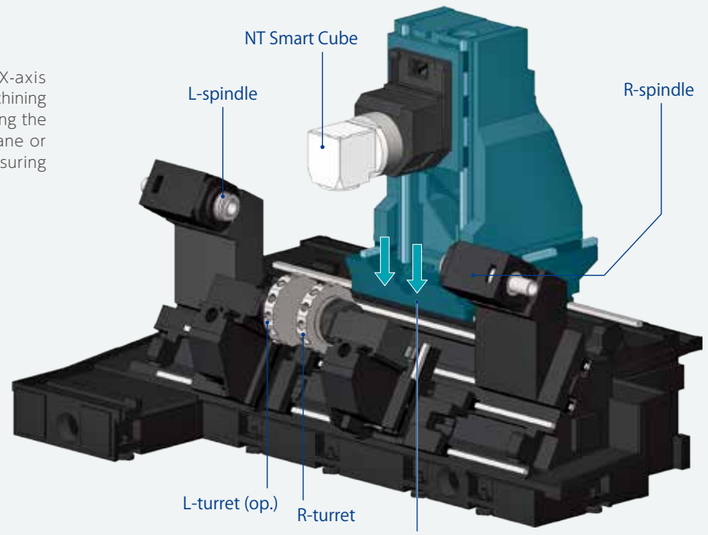
High accuracy milling

Thanks to large Y-axis travel and 125mm X-axis travel beyond the spindle center, various machining o perations 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.



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

Milling motor	*5.5/3.7kW 6,000min-1*
Y-axis slide travel	*±40mm*



Vertical column structure

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

168 tools

Up to 168 tools available !

In addition to 120 qualified ATC tools (op.) for the Tool Spindle, up to 24×2 turning tools (12×2 milling tools) can be mounted on the lower turrets.

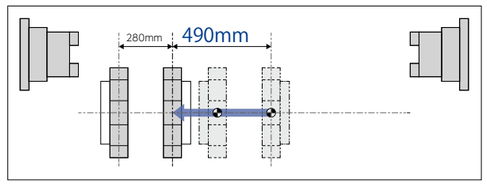
ATC Maintenance Navigator

In addition to the information about the ATC status and position of the Tool Changer arm. The step by step ATC recovery guidance screen ensures fast ATC recovery and shorter machine down-time.

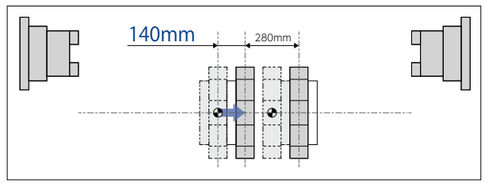
Cross Over Travel for Lower Z-axis (op. L lower turret)

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.

■ R-lower turret / Z2 stroke



■ L-lower turret / Z3 stroke



Various Options to Meet our Customer's Needs.
Total Provider for Peripheral Equipment.

Whether it is machine setup, cutting chip management,
higher efficiency, or improved productivity,
Nakamura-Tome offers top-class peripheral equipment, which
boosts the performance of our Multitasking Machines.
As a total solution provider using our vast experience,
Nakamura-Tome offers complete solutions, including Multitasking
Machines complemented with a great variety of peripheral equipment.

Image steady rest is optional

Gantry Loader (GR-210 High-Speed)
※Right outlet only

Work stocker(WS-442W/445W)

Tool spindle gripper type parts catcher

Fire protection damper

Duct for Oil Mist Collector

Han-Bei (In-process measuring system)

Chip conveyor

Bar feeder

Coolant pump

Tool setter

And many others.
For items not listed, please
feel free to contact your
Nakamura-Tome representative.

Advanced Production System
NT Smart X

Setup Support
- Status Screen
- Setup Screen
- Geometry Navigator (op.)
- Path Checker
- Simple Call
- One Touch Production (op.)
- Digital Chuck Interlock

Programming Support
- Smart Support
- 3D Smart Pro AI
- 3D Smart Pro
- NT Manual Guide i
- Drop Converter

Machining Support
- NT Thermo Navigator AI
- Warm-Up Function
- NT NURSE
- Program Optimizer
- Chatter Canceller
- Oscillation Cutting (op.)
- Smart Tuning (op.)
- NT WORK NAVIGATOR

Dual Safety
- Airbag
- NT Machine Simulation
- NT Collision Guard

Maintenance
- ATC Maintenance Navigator
- Regular Maintenance Function
- Productivity Monitoring Function
- Operation Level Management Function
- Trouble Guidance
- Drive Recorder

Customer Support
- NT Update

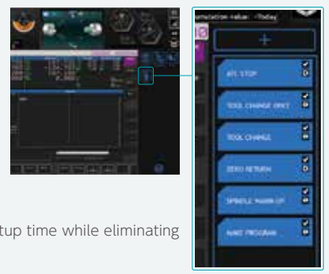
Nakamura-Tome AI

■ Powered by AI as standard equipment
- NT Thermo Navigator AI
- 3D Smart Pro AI

Digital Chuck Interlock

Set the Chuck Open and Close detection position easily.
The chuck open / close position is set up on the NT SmartX screen.
Setup time and machining cycle time are reduced.

One Touch MDI



This function is to register frequently used program blocks or cycles, such as zero return or tool change, and call them again with one touch.

Reduce programming and setup time while eliminating input errors.

NT Smart Sign
Nakamura-Tome IoT software

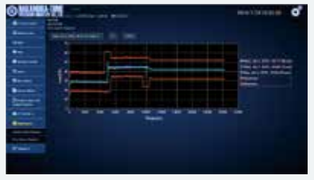
■ Monitoring

Real-Time Monitoring of machine running conditions, in addition to visualizing alarm history and past events.

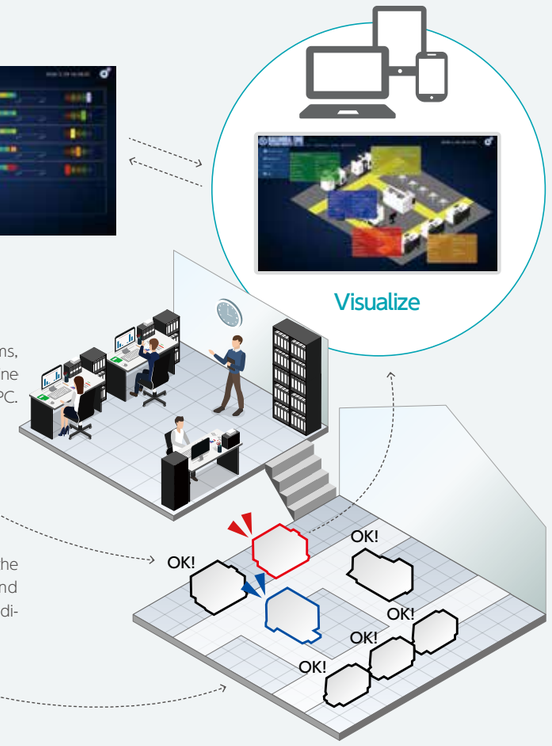
■ Data Input / Output

Input and output programs, tool data and other machine data from the monitoring PC.

■ Diagnosis



Diagnose problems with the machine servo drives and spindle drives, using a dedicated program.



NT Thermo Navigator AI
Thermal Growth Compensation using AI.

Compensation model built using AI machine learning.

① Time
② Measured Dimensions
③ Retrieval of Wear Offset Data

Acquired Data analyzed with NT Thermo Navigator AI

Feedback

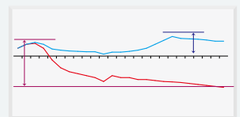
Standard for NT SmartX

Powered by AI

Time and measured dimension data are input into a dedicated AI Learning software, to build an optimized thermal growth compensation model.

High Precision Thermal Growth Compensation

The compensation value is calculated from acquired data. The more data is input, the more accurate is the compensation value.



— Pre-correction thermal displacement data
— Thermal displacement data after correction

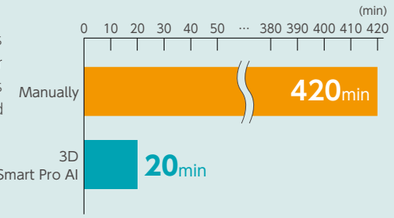
3D Smart Pro AI

AI Analysis NC Programming Support Function

This function analyzes 3D CAD model data and generates an NC program for processing from blank to finished parts.
Simply follow the displayed guidance and enter the required information to create the program.

Operators can also set detailed machining methods.

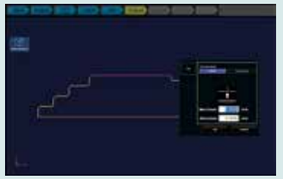
It drastically reduces man-hours required for creating NC programs and improves set up and production efficiency.



* NC programming level : Beginner engineer

Transfer Setting

Once the transfer position is set, the machining area and transfer program are created.



Tolerance Setting

Once the tolerance value is input, the target value for machining can be set.

Optimization of Machining Processes

In addition to defining the required machining processes, AI proposes a suitable machining process sequence.

Tool Guide

If the tool configuration is incomplete, the AI analyzes the CAD model data and provide the necessary tool information.

NT WORK NAVIGATOR

X Y Z B C

No fixtures required

Machining parts with non-round shapes, such as forgings or castings require that the raw part coordinates be recognized by the CNC control.
It works just by touching the part with a simple inexpensive probe (mostly a round bar mounted on a tool holder) and using the torque control feature of the servo-motor, which is to record required coordinates in the CNC.
The NT WORK NAVIGATOR is eliminating the need for positioning fixtures and special clamping devices.

▲Video

Double safety features for maximum protection

NT Machine Simulation / NT Collision Guard + Airbag (Overload detection)

The machine comes protected with dual safety features: "NT Machine Simulation / NT Collision Guard" to prevent a collision beforehand, and the "Airbag Function" minimizes damage to the machine in case of collision.

NT Machine Simulation

Machine collisions are avoidable with Preventive safety technology!

Interference checks can be carried out based on the machining paths obtained from the NC program. By simulating machine operations before starting machining, it is possible to reduce the risk of machining errors and interference.

Simulation is performed while checking the remaining movement amount and modal information.

It is possible to override the settings for rapid and cutting feed individually. Additionally, simulation by process or by single block is possible.

By process
Single feed

Image shown here is of a 2-turret machine

NT Collision Guard

NT Machine Simulation is synchronized with the machine operation, allowing the machine to be operated while performing interference checks. Available in automatic and manual mode. If interference is detected, the machine will stop just before the collision.

Image shown here is of a Tool spindle machine

Airbag (Overload detection)

The software's barrier system is not foolproof. Making a data input mistake will result in a machine collision. However, Nakamura-Tome machines will not break even after the machine collision.

When the machine collides, there is no reason to panic.

The Airbag (Overload detection) of the machine tool significantly reduces the impact of a collision and protects the machine.

Barrier?
Even with barrier function, machine collisions may occur

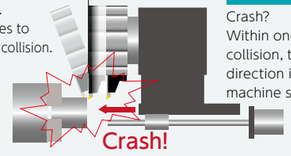
Without Airbag

Machines will not stop immediately.
The slide continues to move even after a collision.

With Airbag

Retraction within 0.001 sec

Crash?
Within one millisecond after a collision, the servo motor direction is reversed, and the machine stops in EMG mode.

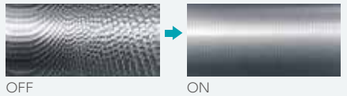


▲Video

* It is not a function that guarantees the prevention of machine break. This function does not eliminate the impact on the machine.

Chatter Canceller

Reduce the chatter and vibration by changing the spindle speed up/down continuously during cutting. This function can be turned ON/OFF simply by M-code.

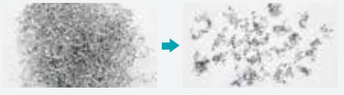


OFF ON

* It does not guarantee that the function works without chatter and vibration.
* Chatter and vibration reduction depend on the setup and the cutting condition.

Oscillation cutting (op.)

By oscillating the tool for a certain period, the chips are cut into small pieces. It can be activated easily by using a simple Fanuc G-code and resolve workpiece damage issues caused by chips twined around the part.



Material : Aluminum
Cutting speed : 200mm/min

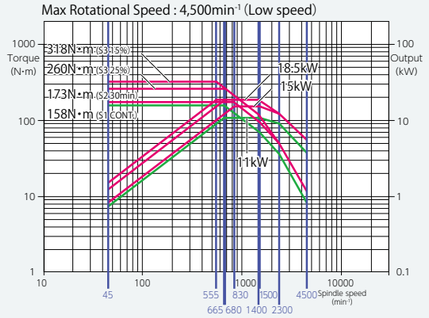
Cutting feed : 0.1mm/rev
Cutting depth : 1.0mm

Torque/Output Chart

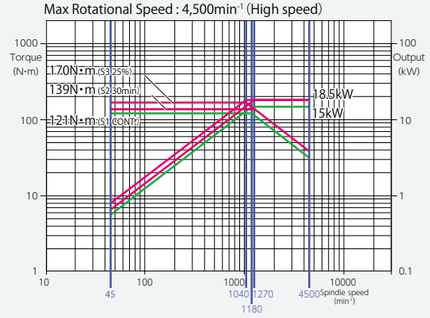
Spindle motor

Bar capacity φ65,71mm 18.5/15kW

Max Rotational Speed : 4,500min-1 (Low speed)

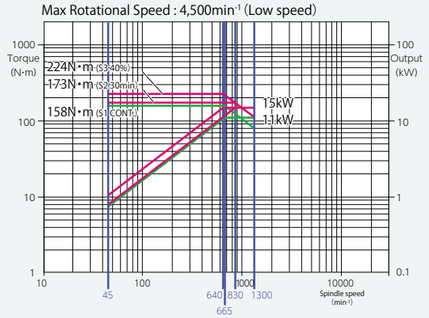


Max Rotational Speed : 4,500min-1 (High speed)

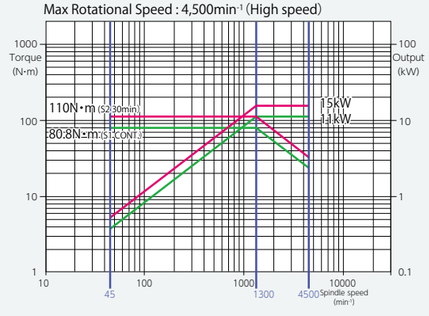


Bar capacity φ71mm 15/11kW

Max Rotational Speed : 4,500min-1 (Low speed)

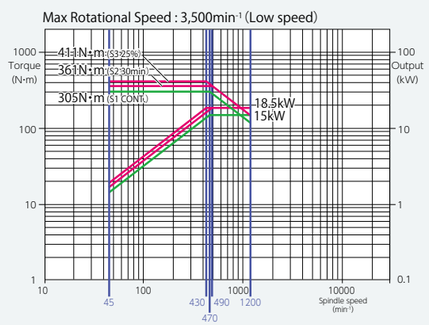


Max Rotational Speed : 4,500min-1 (High speed)

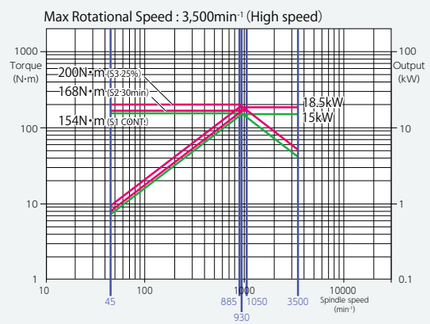


Bar capacity φ80mm 18.5/15kW

Max Rotational Speed : 3,500min-1 (Low speed)



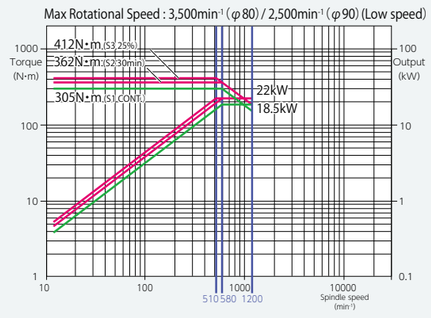
Max Rotational Speed : 3,500min-1 (High speed)



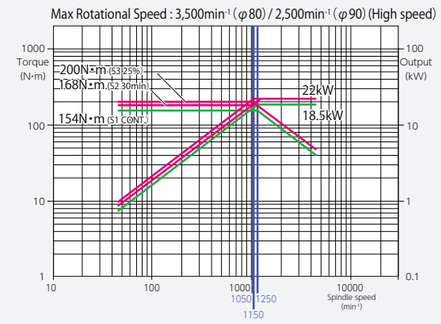
Spindle motor

Bar capacity φ80,90mm 22/18.5kW

Max Rotational Speed : 3,500min-1 (φ80) / 2,500min-1 (φ90) (Low speed)

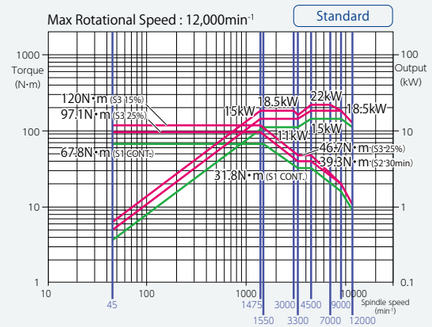


Max Rotational Speed : 3,500min-1 (φ80) / 2,500min-1 (φ90) (High speed)

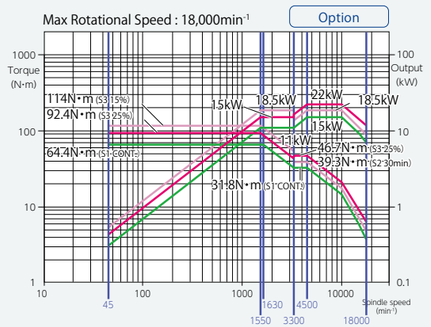


Tool spindle motor

Max Rotational Speed : 12,000min-1 **Standard**

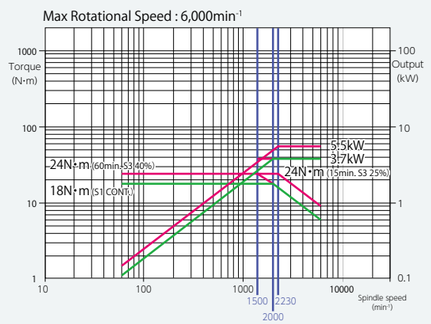


Max Rotational Speed : 18,000min-1 **Option**

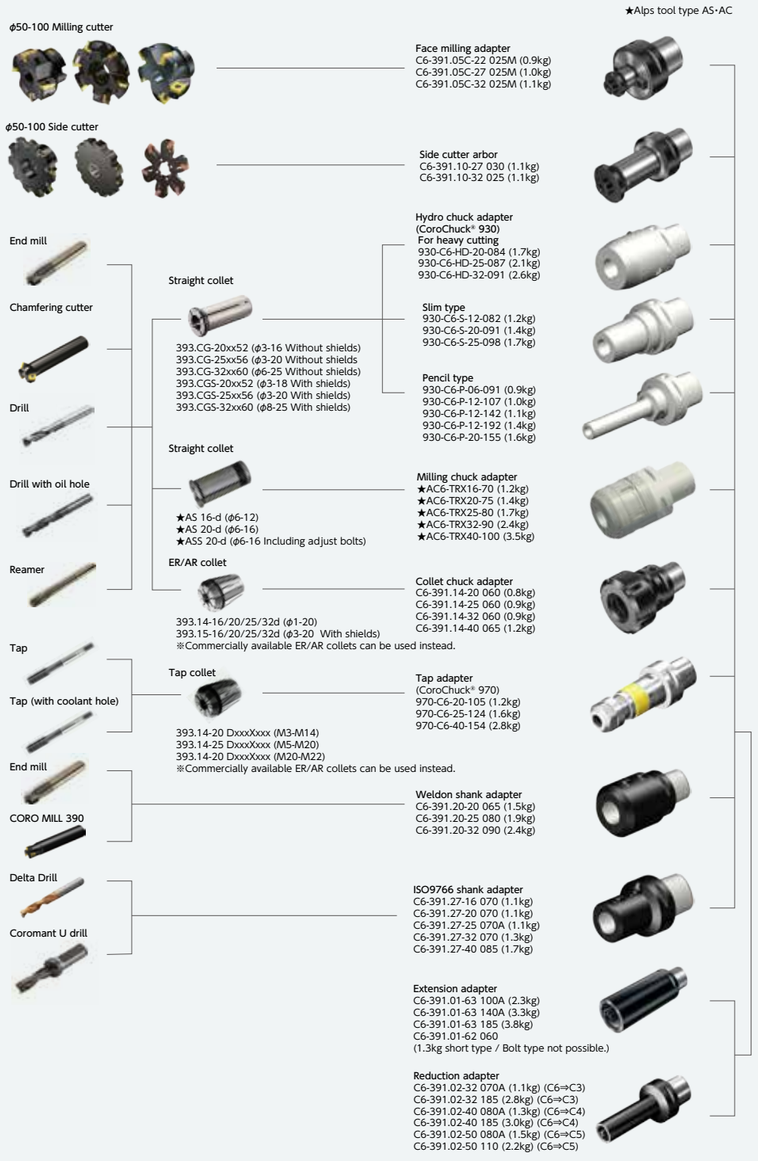


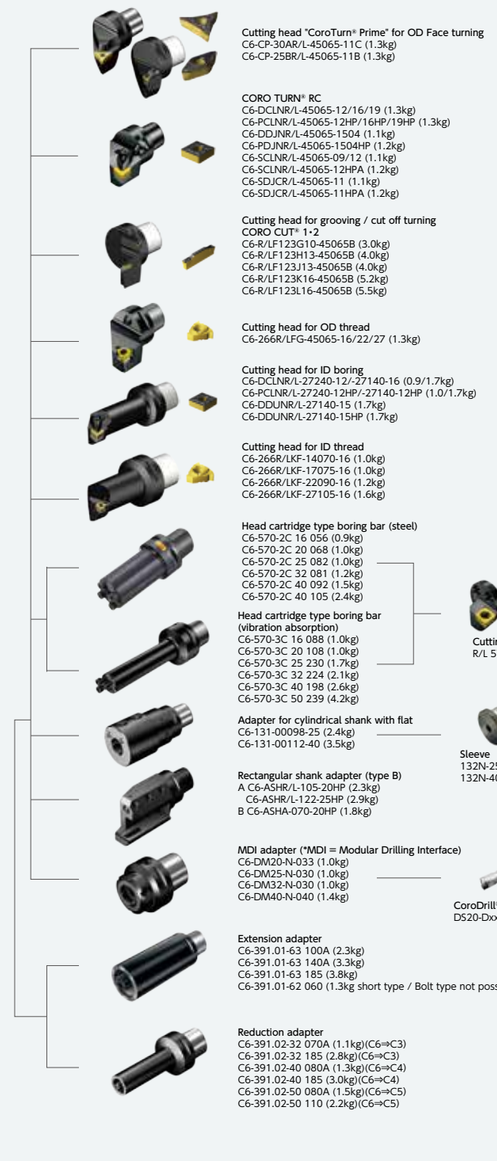
Milling motor

Max Rotational Speed : 6,000min-1



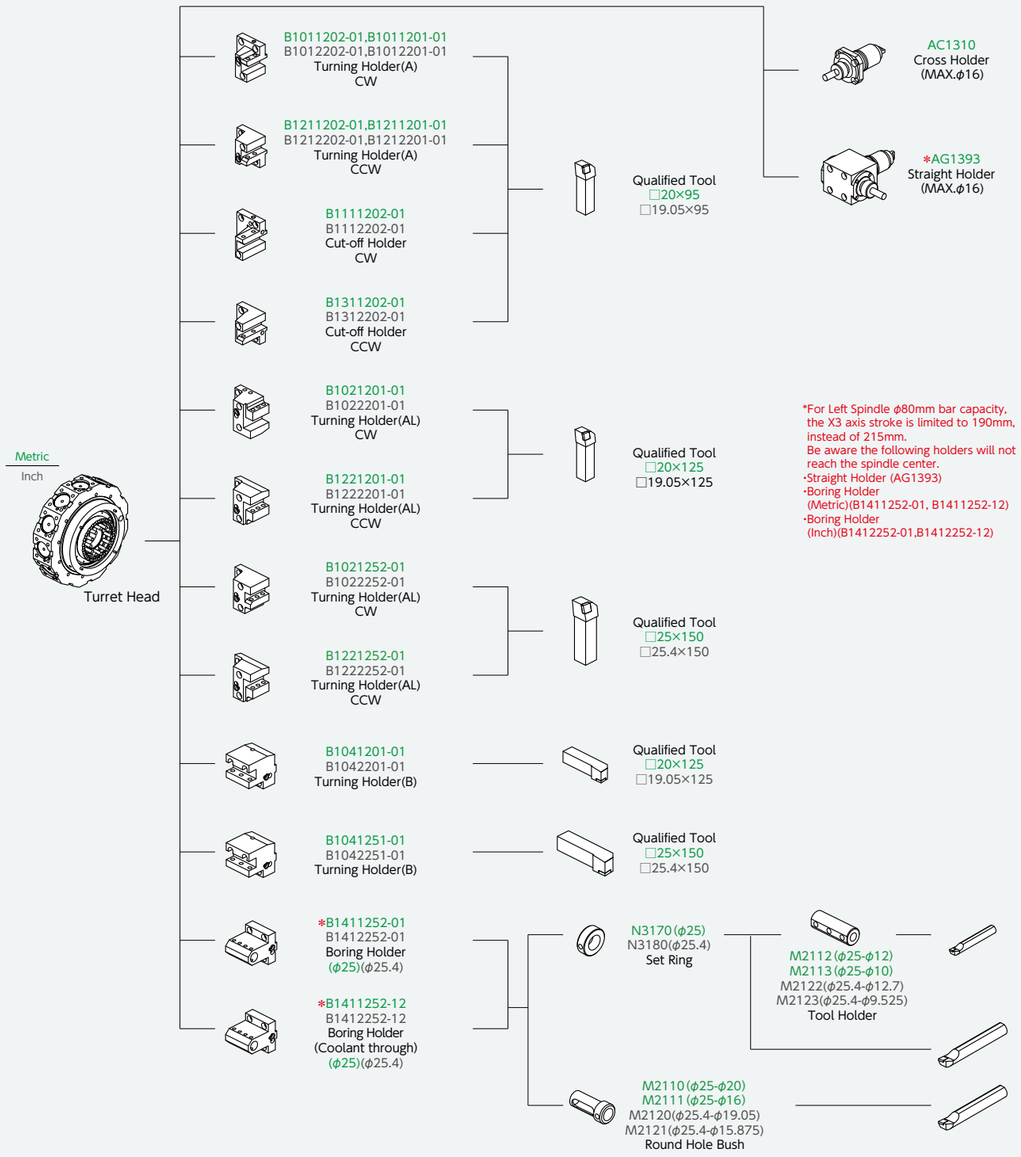
Tooling System　Sandvik Coromant Capto C6





* For details, refer to the Sandvik Coromant Tooling Catalog.

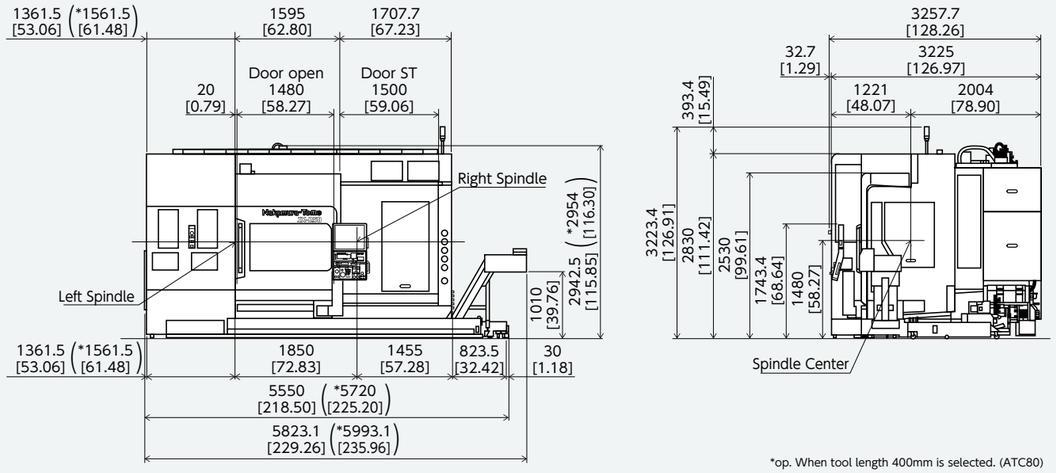
Tooling System



*For Left Spindle ϕ80mm bar capacity, the X3 axis stroke is limited to 190mm, instead of 215mm.
Be aware the following holders will not reach the spindle center.
・Straight Holder (AG1393)
・Boring Holder (Metric)(B1411252-01, B1411252-12)
・Boring Holder (Inch)(B1412252-01,B1412252-12)

Machine Dimensions

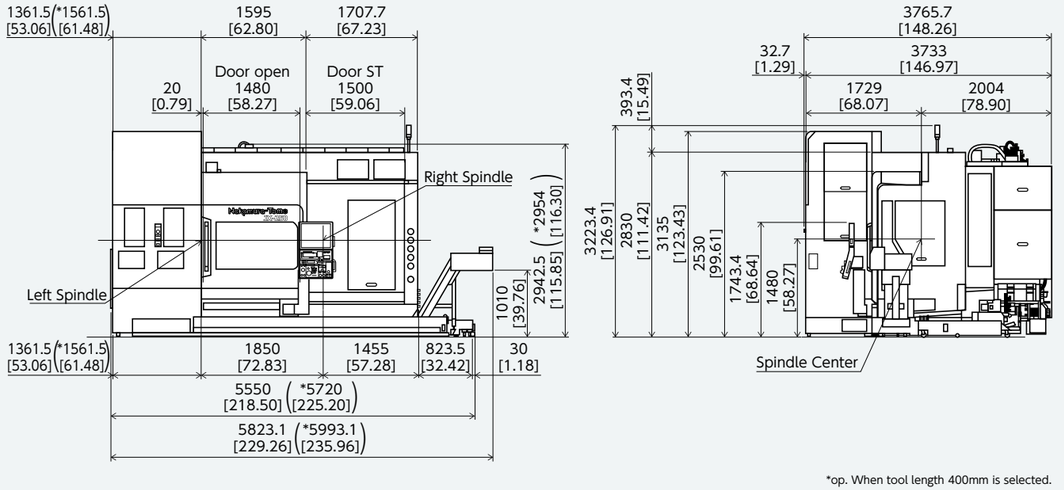
ATC 40 and 80 tools specs



*op. When tool length 400mm is selected. (ATC80)

mm[inch]

ATC 120 tools specs

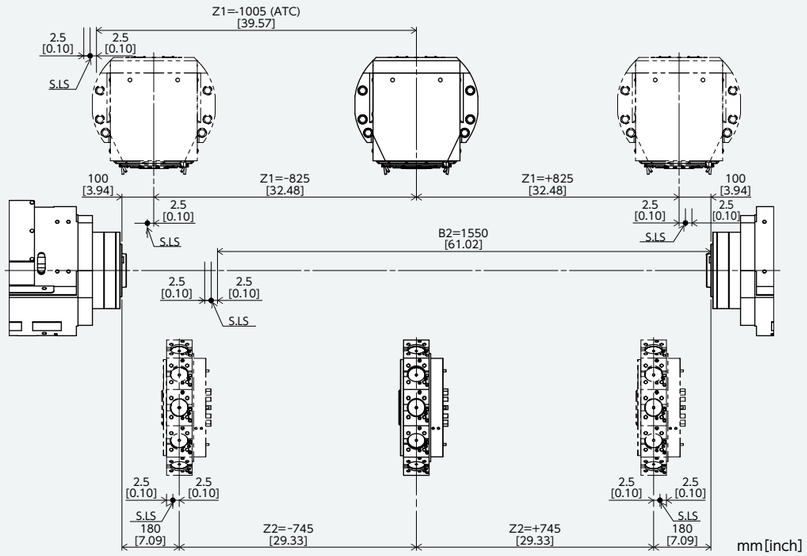


*op. When tool length 400mm is selected.

mm[inch]

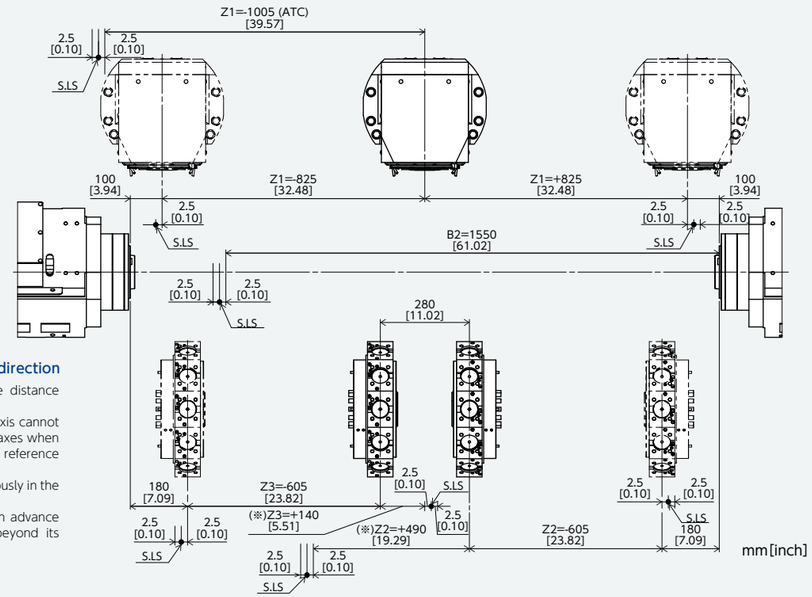
Travel Range

Single turret



mm[inch]

Twin turret

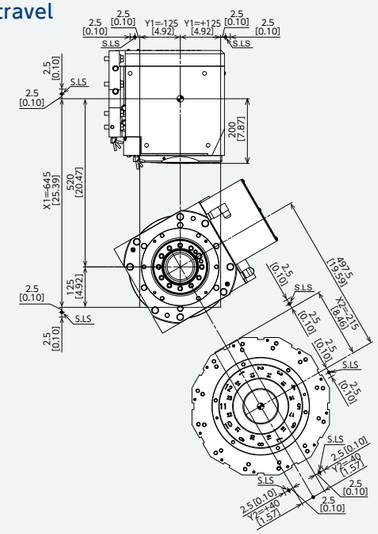


mm[inch]

※Z2-axis and Z3-axis travel in plus direction

An interlock is applied to keep a relative distance between Z2-axis and Z3-axis.
The distance between the Z2-axis and Z3-axis cannot get closer than the distance between both axes when they are at 2.5mm beyond their respective reference points.
Z2-axis and Z3-axis cannot move simultaneously in the plus direction.
Z3-axis shall move in the minus direction in advance before moving Z2-axis in plus direction beyond its reference point, and vice versa.

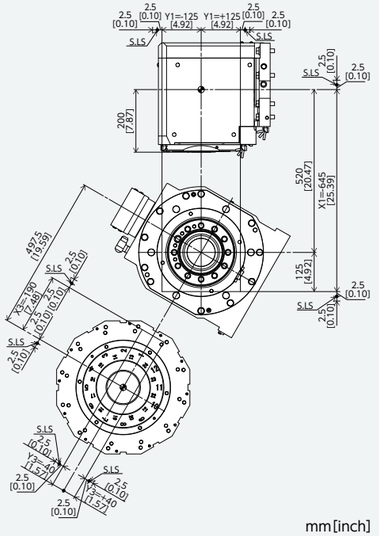
X-Y Axis slide travel



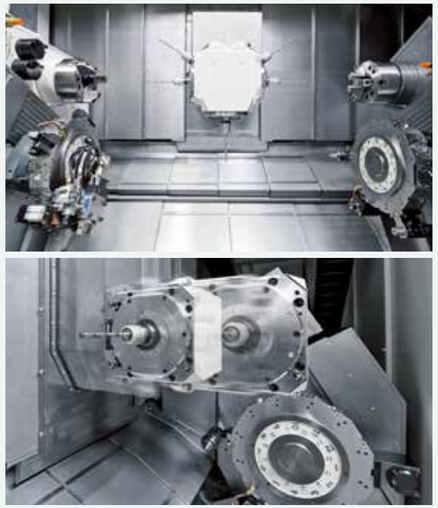
mm[inch]

X-Y Axis slide travel (L side ϕ80)

*ϕ80mm Left spindle specifications X3 and Y3 axis only.

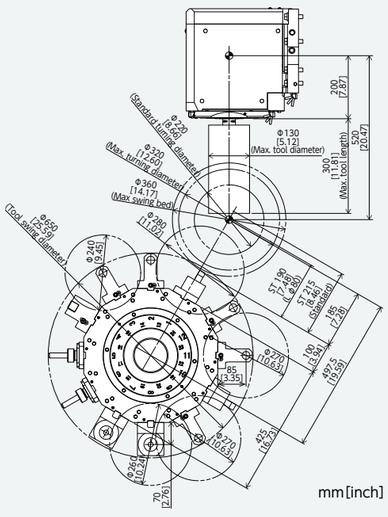


mm[inch]



Tool Interference

*For Left Spindle ϕ80mm bar capacity, the X3 axis stroke is limited to 190mm, instead of 215mm.
Be aware the following holders will not reach the spindle center.
・Straight Holder (AG1393)
・Boring Holder (Metric)(B1411252-01、B1411252-12)
・Boring Holder (Inch)(B1412252-01、B1412252-12)



mm[inch]

■ Capacity

	φ65	φ71(op.)	φ80(op.)	φ90(op.) *1
Max. turning diameter	320mm			
Distance between spindles	max.1,850mm / min.300mm			max.1,787mm / min.237mm
Max. turning length	1,650mm			1,587mm
Bar capacity	φ65mm	φ71mm	φ80mm	φ90mm
Chuck size	8", 10", 12", 15"	8", 10", 12"		

■ Axis travel • Rapid feed rate

X1-axis slide travel	645mm			
X2-axis slide travel	215mm / 190mm*2	215mm		
X3-axis slide travel(op.)	215mm		190mm	–
Z1-axis slide travel	±825mm (at ATC -1,005mm)			
Z2-axis slide travel	±745 (Without Z3) / +490, -605 (With Z3)			±745
Z3-axis slide travel(op.)	-605, +140			–
Y1-axis slide travel	±125mm			
Y2-axis slide travel	±40mm			
Y3-axis slide travel(op.)	±40mm			–
B2-axis slide travel	1,550mm			
X1-axis rapid feed rate	36m/min			
X2/X3-axis rapid feed rate	16m/min			
Z1-axis rapid feed rate	40m/min			
Z2/Z3-axis rapid feed rate	40m/min			
Y1-axis rapid feed rate	36m/min			
Y2/Y3-axis rapid feed rate	6m/min			
B2-axis rapid feed rate	40m/min			

■ L-spindle

Spindle speed	4,500min-1	4,500min-1	3,500min-1	2,500min-1
Spindle motor	18.5/15kW		18.5/15kW, 22/18.5W	22/18.5W
Spindle nose	A2-6	A2-6	A2-8	A2-8
Hole through spindle	80mm	80mm	90mm	107mm
I.D. of front bearing	120mm	120mm	130mm	150mm
Hole through draw tube	66mm	72mm	81mm	91mm

■ R-spindle

Spindle speed	4,500min-1*3	4,500min-1	–	–
Spindle motor	18.5/15kW	18.5/15kW, 15/11W	–	–
Spindle nose	A2-6, A2-8*2	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 / 18,000min-1 (op.)
Tool Spindle motor	22/15kW
Swiveling range	240° (±120°)
Tool coupling type	CAPTO C6 / HSK-T63(op.)
Number of tools	80, 40(op.), 120(op.)
Max. tool diameter / Without adjacent tool	90mm / 130mm
Max. tool length	300mm / 400mm(op. ATC 80, 120)

■ 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 : Lower turret

Rotary system	Individual rotation
Milling speed	6,000min-1
Milling motor	5.5/3.7kW
Spindle speed range	Stepless
Number of milling stations	12
Tool size	Straight holder φ1mm – φ16mm
	Cross holder φ1mm – φ16mm

■ General

Height		2,954mm
Floor space (W x D)		5,578.5mm ×3,257.7mm(ATC 40, 80) 5,578.5mm ×3,765.7mm(ATC 120)
Machine weight (incl. control)	Without L-lower turret	22,500kg (ATC 40) 23,000kg (ATC 80) 24,000kg (ATC 120)
	With L-lower turret	23,500kg (ATC 40) 24,000kg (ATC 80) 25,000kg (ATC 120)

■ Power requirements

Power supply	Without L-lower turret	65.7kVA (L-spindle 15/11kW, R-spindle 15/11kW)
		69.3kVA (L-spindle 18.5/15kW, R-spindle 15/11kW)
	With L-lower turret	70.7kVA (L-spindle 15/11kW, R-spindle 15/11kW)
		74.3kVA (L-spindle 18.5/15kW, R-spindle 15/11kW)

*1 It is only available for single turret machine.
It is NOT available for gantry loader specifications.
*2 Specifications when 15 inch chuck is selected.
*3 There is limitation on maximum spindle speed with 15 inch chuck.

●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.

■ 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)
	Y1:	1～8000mm/min, 0.01～315inch/min (1～4800mm/min, 0.01～188inch/min)
	Y2,Y3:	1～6000mm/min, 0.01～236inch/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. In normal operation, It is enabled 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% (can be set from 0~100 in 10% intervals on 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		Battery backup
Background 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-inch color SXGA LCD touch panel
Operation panel : Keyboard	QWERTY keyboard

■ Programming assist functions

Circular interpolation R programming	Standard
Direct drawing dimension pro-gramming or Chamfering/Corner R	Standard (Direct drawing dimension programming is standard)
Canned cycles	G90, G92, G94
Multiple repetitive canned cycles	G70 ～ G76
Multiple repetitive canned cycles II	G71, G72
Canned cycles for drilling	G80 ～ G89
Sub program	Standard
Custom macro	Standard (common variables #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

■ Machine support functions

Rigid tapping	Standard
Spindle synchronised control	Standard
C axis synchronised control	Standard (G496 C1. rapid feed positioning)
Spindle orientation	Standard
Tool spindle orientation	Standard : 4 positions (90° ×4) (M785/ M786/ M787/ M788)
	Maximum : 12 positions (12×30°) (G419)

■ ECO functions

Servo motor power off	Standard (Switch on Power Saving Mode in NT Setting screen)
Control of motor output during acceleration and deceleration	Standard (Switch on Power Saving Mode in NT Setting screen)
G code for servo motor energy-saving during acceleration and deceleration	G356/G357
Automatic light off	Standard (Switch on Power Saving Mode in NT Setting screen)
Automatic monitor off	Standard (Switch on Power Saving Mode in NT Setting screen)

Nakamura-Tome

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