

# SC-200III

NAKAMURA-TOME  
PRECISION INDUSTRY CO.,LTD.

## Next level machining

Innovative  
Technology

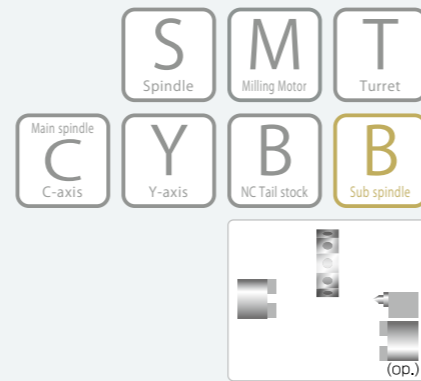
~Creating new values~

# SC-200IIL

The advance of SC-200L!

With a highly rigid slant bed with box way slides, suitable for heavy cutting and high precision machining.

8" class single-turret machine capable of performing one-rank higher machining.

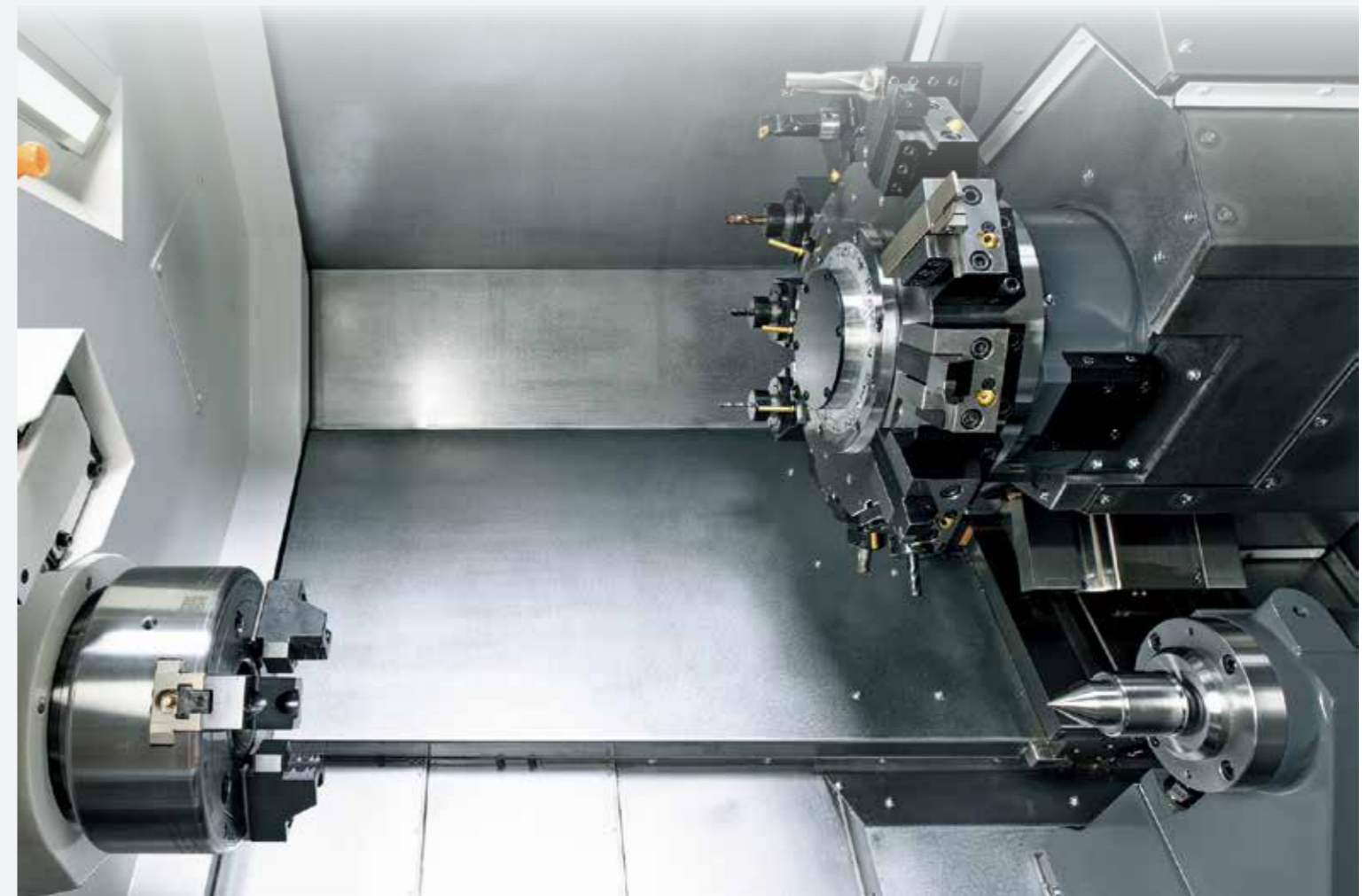


## Suitable for Machining Long Workpieces

It carries out great machining rigidity and stability, with a highly rigid slant bed with box-way slides.

Although it is an 8" class machine, it holds a maximum turning diameter of 390mm and a tool swinging diameter of 620mm, thus ensuring a machining area equivalent to that of a 10" class machine.

In addition, the distance between centers has been increased to 715mm (distance between spindles: 800mm). NC tailstock specifications are now standard, making it easier to machine long workpieces.



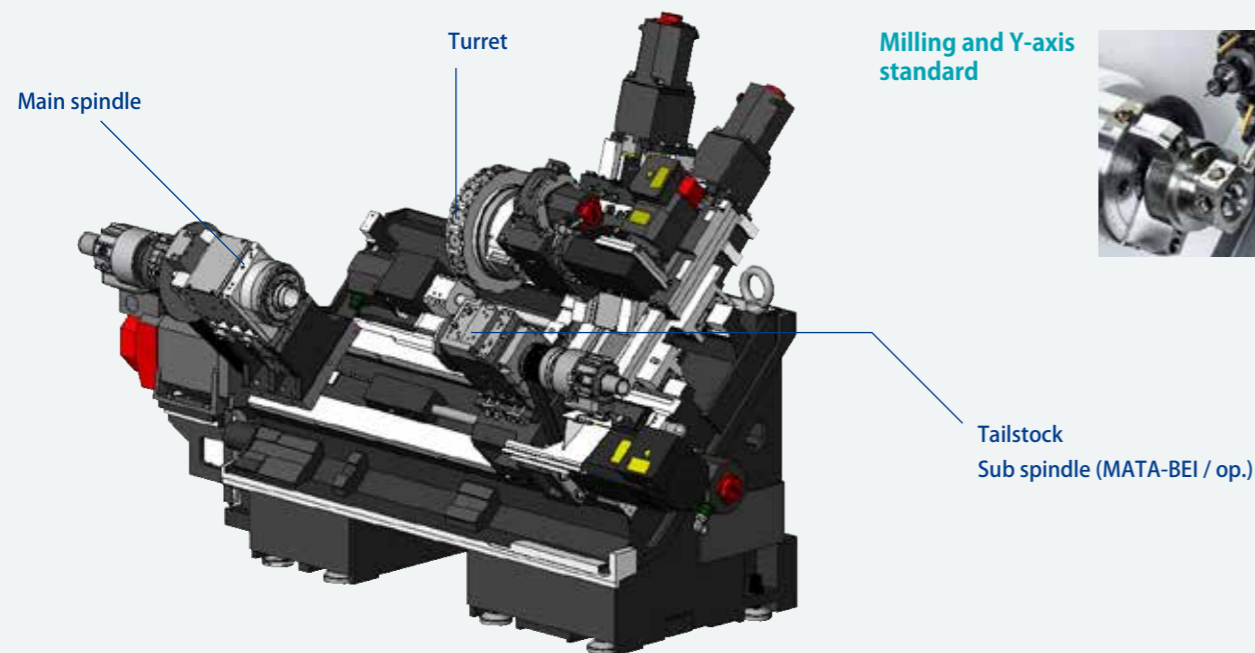
## Easier to use, more efficient Next level machining

### Main spindle

Standard		Option	
Bar capacity	Φ65mm	Bar capacity	Φ71mm
Spindle speed	4,500min <sup>-1</sup>	Spindle speed	4,500min <sup>-1</sup>
Standard		Option	
Spindle motor	15/11kW	Spindle motor	18.5/15kW
		Spindle motor	15/11kW
		Spindle motor	18.5/15kW

### Turret

Standard		Option	
Y axis slide travel	±50mm	Type of turret head	Dodecagonal
Milling spindle speed	6,000min <sup>-1</sup>	Type of turret head	Hexadecagon
Milling motor	5.5/3.7kW	Number of milling stations / Number of indexing positions	12 / 24
		Number of milling stations / Number of indexing positions	16 / 16



### Milling and Y-axis standard

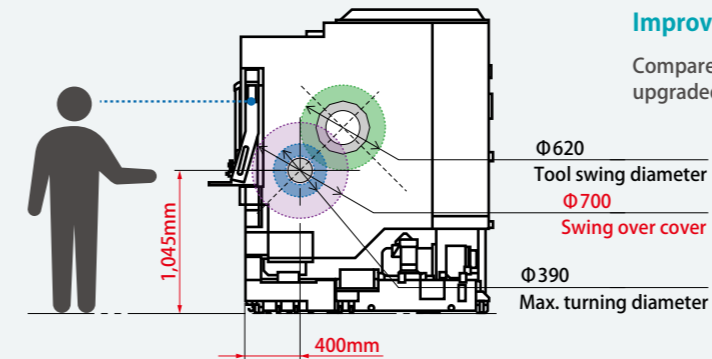


### Tailstock

Standard	
Driving system	NC control servo-driven type
Quill taper	MT-4(Rotating center), MT-3(Built-in center)
Range of thrust force	2.5 - 6.5kN

### Sub spindle (MATA-BEI / op.)

Option	
Bar capacity	φ51mm
Spindle speed	5,000min <sup>-1</sup>
Spindle motor	15/11kW



### Improved swing, and machining diameters

Compared to the previous model, the machining product range has been upgraded, giving it the ability to perform one-rank higher machining.

### Stress-free

For best accessibility, the distance from machine front to spindle, and the spindle height have been improved. The control panel height was designed for optimum operator comfort. Ergonomically designed for a more comfortable posture.

### Nakamura-Tome FANUC Oi-TF Plus 15 inch touch screen

With a movable operation panel, the angle can now be adjusted by the operator.



### Tool setter(op.)

Can be configured for a detachable, or for an automatic swing-down type tool setter.



### Chip conveyor(op.)

Can be configured for ejection from the side or from the back.

### GR-203 High-Speed(op.)

The whole process from loading a blank material to unloading a finished part can be automated.

\* The image is of NTY-100.

### Parts catcher type A(op.)

Discharging of remnants and finished parts can be automated.



Option	
Diameter	Φ15 - Φ71mm
Length	30 - 150mm
Weight	0.1 - 1.5kg



### User friendly

Redesigned to make it easier to refill the lubrication oil tank.





## FANUC 0i-TF Plus with iHMI 15 inch touch screen control



### ■ Tool Manager

Tooling information such as tool life and geometry value can be managed.



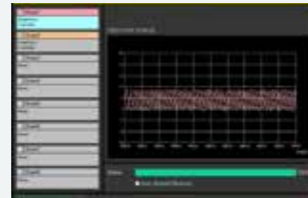
### ■ Maintenance Manager

Maintenance information such as the life of consumable parts can be managed, and each item can be customized.



### ■ Servo Viewer

By testing a measurement, the load, position, and speed of each axis are read and visualized with a waveform.



### ■ Manual

All Manuals can be viewed. Manuals can be added or deleted.



## Full Operator Support from Ease of Use to Reliability

### Smart Support

Processes using original Nakamura-Tome G-codes were registered as fixed forms. Programs can be easily created by inputting data through an interactive 3D guidance window.



### Digital Chuck Interlock

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



## NT Smart Sign Nakamura-Tome IoT software

※Please refer to the NT Smart Sign exclusive catalog for details.

### ■ Monitoring



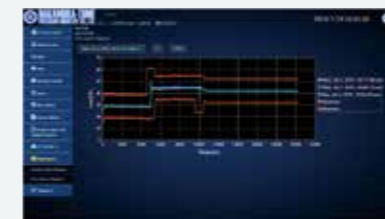
Real-Time Monitoring of machine running conditions, in addition to visualizing alarm history and past events.

### ■ Data Input / Output

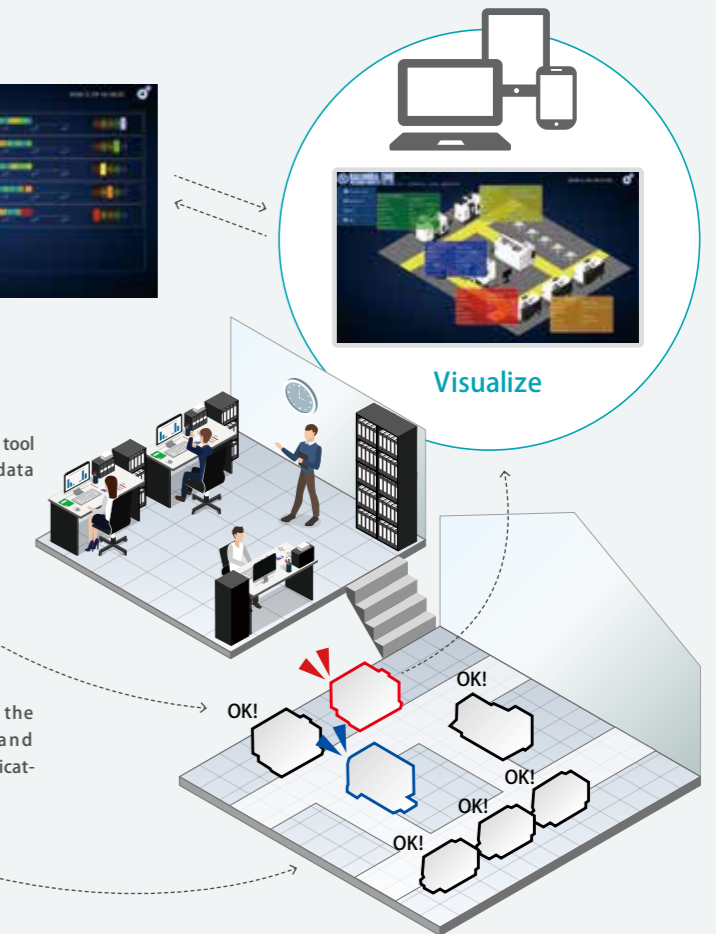


Input and output programs, tool data and other machine data from the monitoring PC.

### ■ Diagnosis



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



## NT Thermo Navigator AI Thermal Growth Compensation using AI.

- ① Time
- ② Measured Dimensions
- ③ Retrieval of Wear Offset Data



Acquired Data analyzed with NT Thermo Navigator AI

Feedback

Compensation model built using AI machine learning.



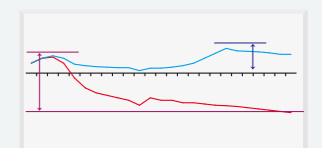
### Powered by AI

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

## Featuring Functions to Make Efficient Programs, Faster

### Advanced NT NURSE

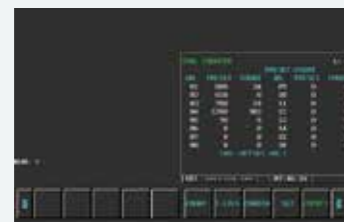
※Depending on machine specifications, some functions are not available.

All-in-one software!

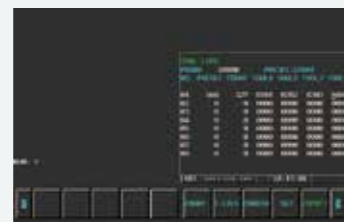
NT Nurse is software that provides the operator with user-friendly support for operation, programming and production on the machine. Among vital features are phase recognition (a must for multitasking), direct chucking to prevent positioning error during transfer, and perfect synchronization of the left and right hand

spindles. Among other features, are the load monitor for detecting tool wear and tool breakage, tool life management, operation condition monitoring, in addition to many other features to simplify programming, set up, operation and production, all offered in one single package.

#### Useful functions



Tool Counter



Tool Life



Operation Condition of each Tool



Energy Saving

\* The screen image is from NT SmartX

### Airbag (Overload detection)

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.



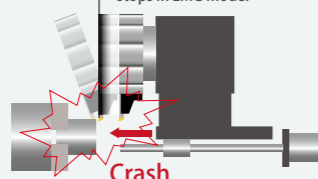
**Without Airbag**  
Machines will not stop immediately. The slide continues to move even after a collision.



**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



\* This feature does not mean zero impact

Barrier? Even with barrier function, machine collisions may occur

### NT WORK NAVIGATOR

Machining parts with non-round shapes, such as forgings or castings require that the raw part coordinates be recognized by the CNC control.

No fixtures required

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

### NT Manual Guide i (LUCK-BEI II)

A programming guidance system with the ability to generate NC programs (ISO/EIA G-code programs) easily. Processes created in conversational mode can be cut, copied or pasted ensuring flexibility. Additionally, several cycles such as part-transfer cycle, requiring waiting M-codes, are readily made with the "NC program editing support function". The "NC program simulation function" can be used to check created- programs by tool-path simulation or solid-model animation.



#### ▲ Process Editing Function

NT Manual Guide i automatically recognizes each process and lists all processes. Operator can easily change and optimize the program by moving processes, copying processes or adding waiting-functions.



#### ▲ Fixed-form sentence function

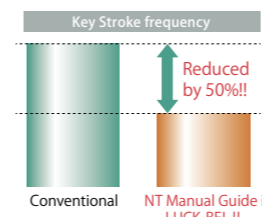
NT Manual Guide i contains more than 300 types of fixed form sentences. Operator can select these fixed form sentences for the program from a menu screen.



#### ▲ Simulation

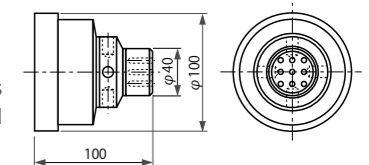
Accurate simulation of turning and milling operations using a 3D solid model.

By introducing the "automatic cutting condition setting function", the number of key strokes required to make a program were reduced by 50% reduced, compared with the previous NT-Manual guide version.



### Automatic Cutting-Condition Setting Function

By setting the material type and required surface roughness, cutting conditions are automatically generated. These can be also changed depending on customer's experience.



By selecting the material, cutting conditions B are automatically input.



By setting the surface roughness, machining conditions are automatically input

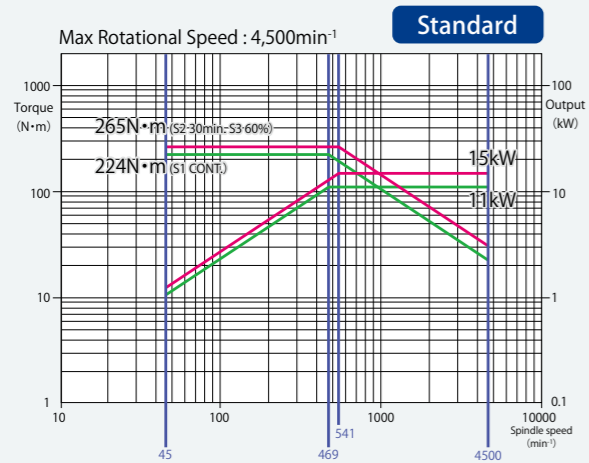


Cutting conditions. End mill

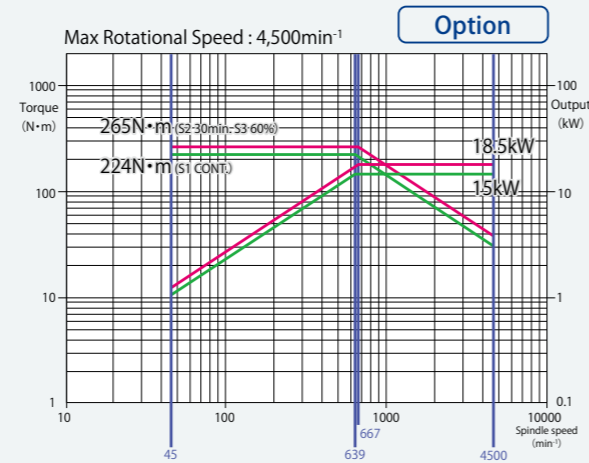
Torque/Output Chart

Main spindle

Bar capacity  $\phi 65 / \phi 71$ (op.)  
15/11kW

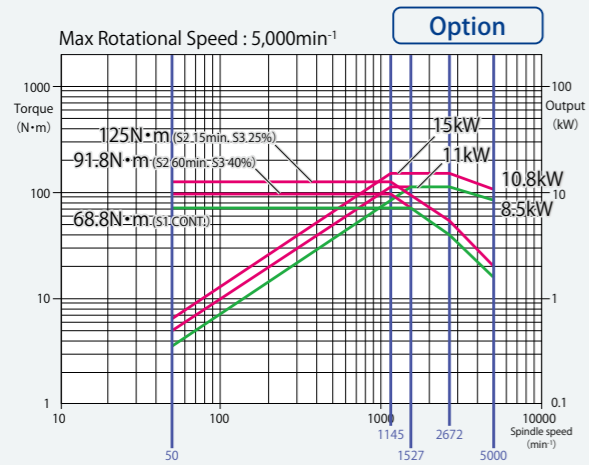


Bar capacity  $\phi 65 / \phi 71$ (op.)  
18.5/15kW



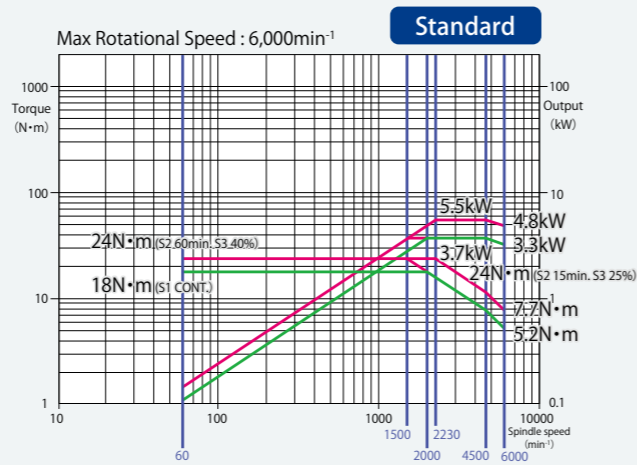
Sub spindle(op.)

Bar capacity  $\phi 51$ (op.)  
15/11kW



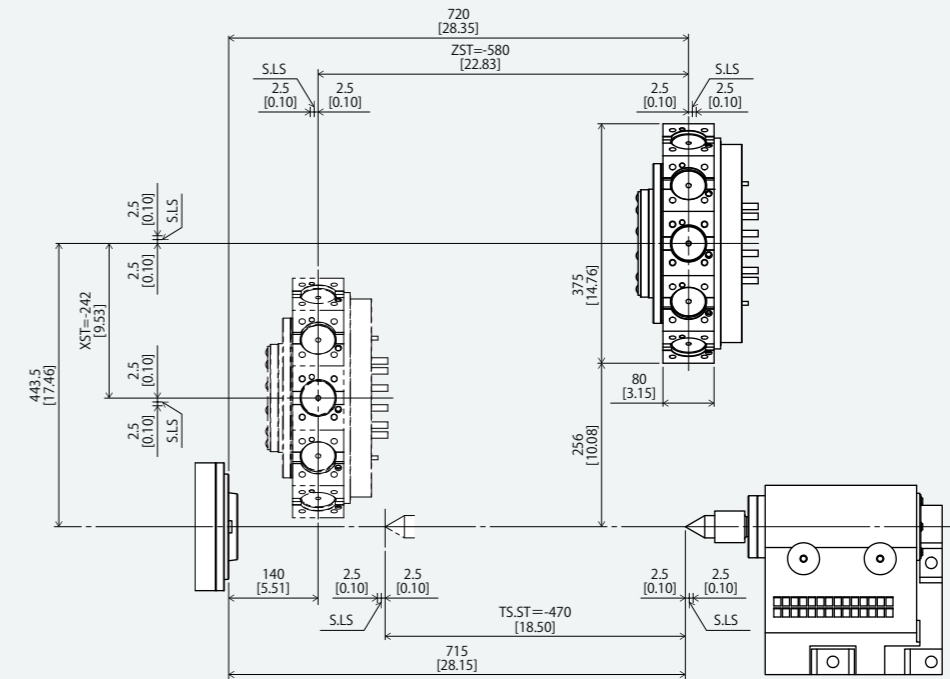
Milling motor

5.5/3.7kW

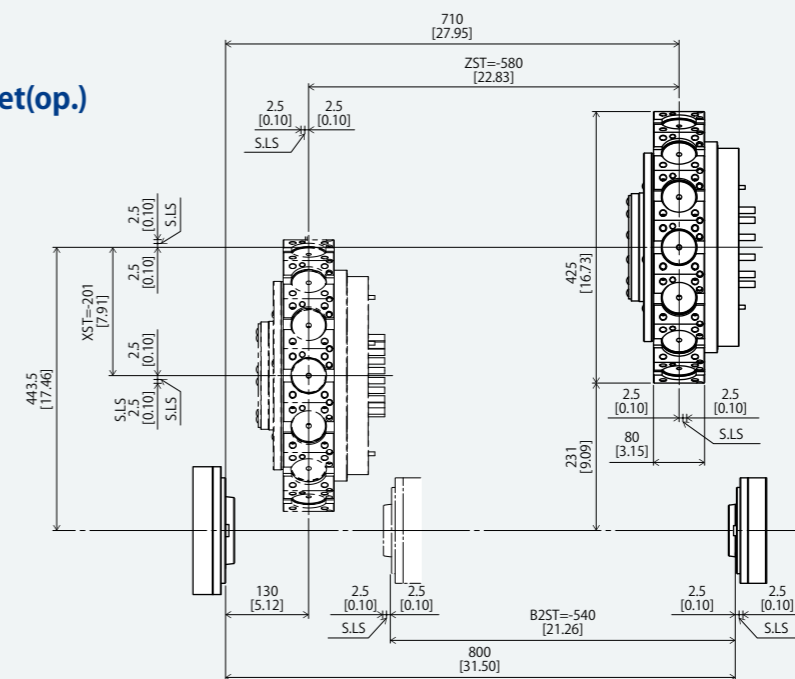


Travel Range

NC tailstock



Sub spindle  
Hexagonal turret(op.)

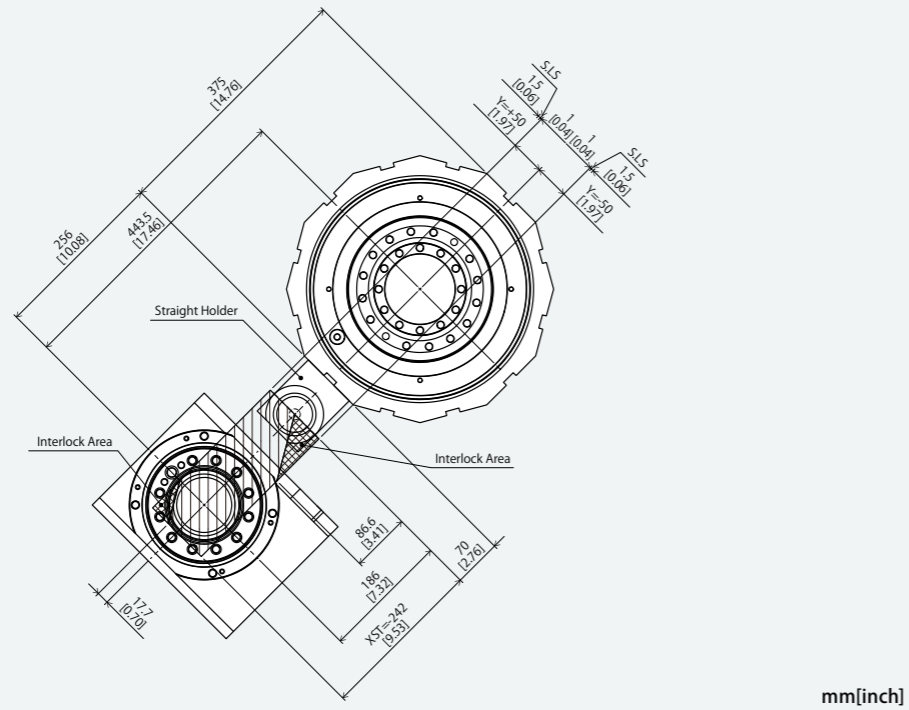


mm[inch]

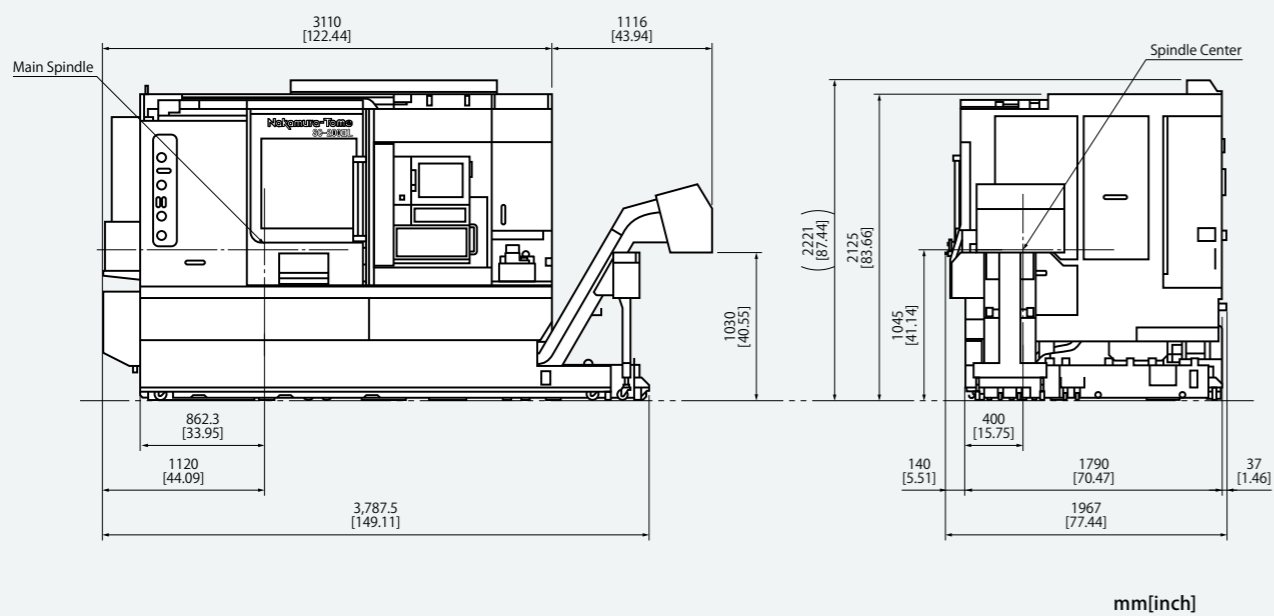


### Travel Range

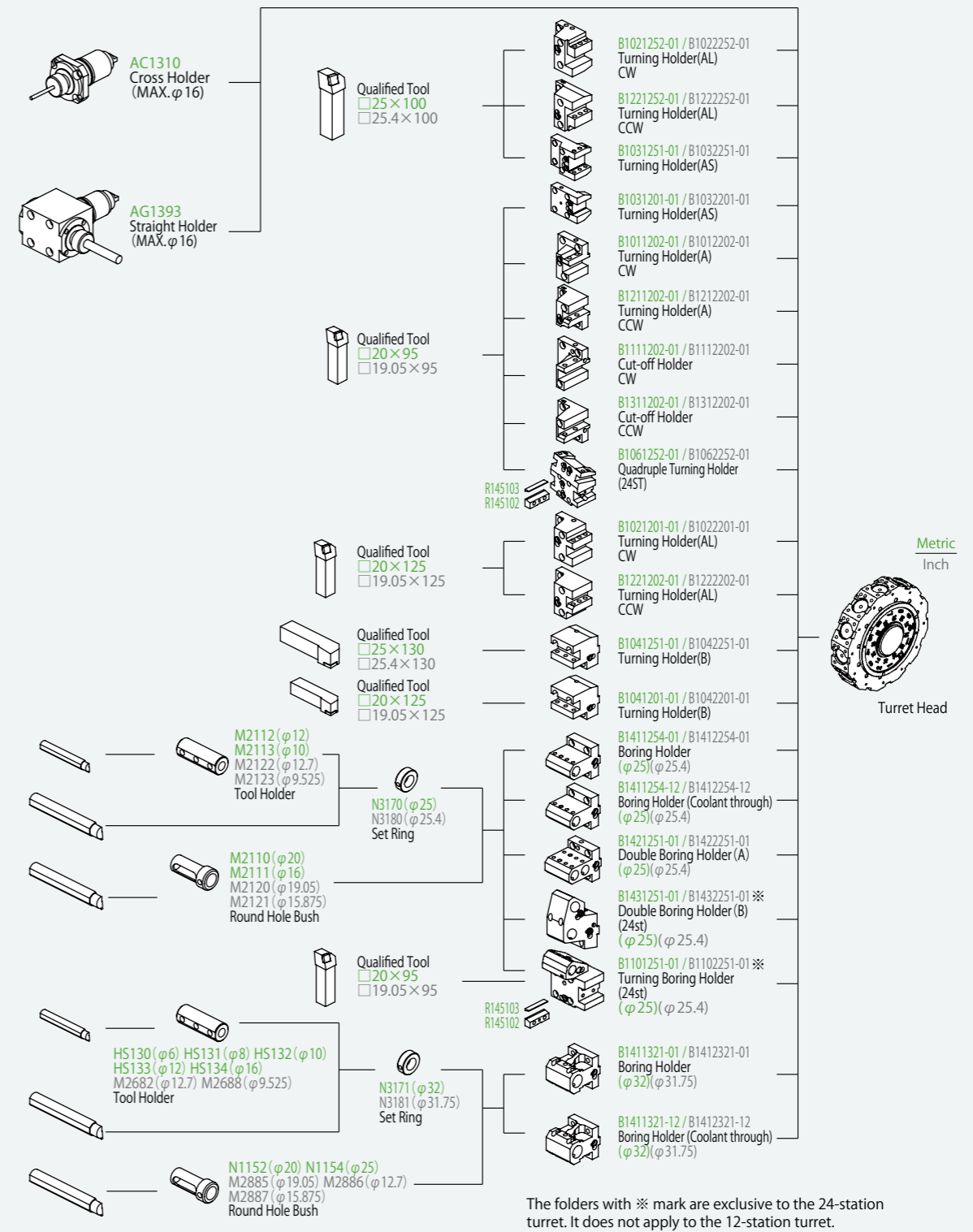
#### Y-axis slide travel



### Machine Dimensions



### Tooling System



The folders with ※ mark are exclusive to the 24-station turret. It does not apply to the 12-station turret.

■ Capacity		φ65	φ71(op.)	φ51(op.)
Max. turning diameter	12st	390mm		
	16st(op.)	340mm		
Distance between centers		max.715mm / min.245mm		
Distance between spindles(op.)		800mm		
Max. turning length		522.8mm		
Bar capacity		φ65mm	φ71mm	φ51mm
Chuck size		8"	10"	6" / 8"

■ Axis travel		
X-axis slide travel	242mm	201mm
Z-axis slide travel	580mm	
Y-axis slide travel	±50mm	
B-axis slide travel(op.)	540mm	

■ 早送り速度	
X軸早送り速度	24m/min
Z軸早送り速度	36m/min
Y軸早送り速度	6m/min
B軸早送り速度 (op.)	20m/min

■ Main spindle			
Spindle speed	4,500min <sup>-1</sup>	4,500min <sup>-1</sup>	—
Spindle speed range	Stepless	Stepless	—
Spindle nose	A2-6	A2-6	—
Hole through spindle	80mm	80mm	—
I.D. of front bearing	110mm	110mm	—
Hole through draw tube	66mm	72mm	—

■ Sub spindle(op.) *2			
Spindle speed	—	—	5,000min <sup>-1</sup>
Spindle speed range	—	—	Stepless
Spindle nose	—	—	A2-5
Hole through spindle	—	—	63mm
I.D. of front bearing	—	—	90mm
Hole through draw tube	—	—	52mm

#### ● 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 the 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, expansion 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.

■ Turret		
Type of turret head	12st	Dodecagonal
	16st(op.)	Hexadecagon
Number of Indexing positions	12st	24
	16st(op.)	16
Tool size (square shank)	□20mm, □25mm	
Tool size (round shank)	φ25mm, φ32mm	

■ Milling		
Rotary system	Individual rotation	
Milling spindle speed	6,000min <sup>-1</sup>	
Spindle speed range	Stepless	
Number of milling stations	12st	12
	16st(op.)	16
Tool size	Straight holder φ1mm - φ16mm	
	Cross holder φ1mm - φ16mm	

■ Tailstock *1	
Driving system	NC control servo-driven type
Travel	470mm
Rapid feed	8m/min
Quill taper	MT-4(Rotating center), MT-3(Built-in center)
Quill diameter / Quill stroke	—
Range of thrust force	2.5-6.5kN

■ Drive motor	
Main spindle motor	15/11kW, 18.5/15kW(op.)
Sub spindle motor	15/11kW
Milling motor	5.5/3.7kW

■ General	
Height	2,125mm
Max. height of movable part	2,221mm
Floor space (L x W)	3,787.5mm x 1,967mm
Machine weight (incl. control)	8,500kg

■ Power requirements	
Power supply	24.0kVA (Main spindle 15/11kW)
	27.3kVA (Main spindle 18.5/15kW)
	31.6kVA (Main spindle 15/11kW, Sub spindle 15/11kW)
	34.9kVA (Main spindle 18.5/15kW, Sub spindle 15/11kW)

\*1 NC tailstock (MT-4/rotating center) specification is standard.

\*2 When the sub spindle specification is selected, the dodecagonal turret is not selectable.

■ Items	
Control type	Nakamura-Tome FANUC (Oi-TF Plus)
■ Controlled axes	
Controlled axes	4 axes(X, Z, C, Y)
Simultaneously Controlled axes	4 axes
■ Input command	
Least input increment	X,Z,Y : 0.001mm/0.0001inch (diameter for X-axis), C : 0.001°
Least command increment	X : 0.0005mm / Z,Y : 0.001mm / C : 0.001°
Max. programmable dimension	±999999.999mm / ±39370.0787in, ±999999.999°
Absolute/ Incremental programming	X, Z, C, Y / U, W, H, V
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 ~ 6000mm/min, 0.01 ~ 236inch/min (1 ~ 4800mm/min, 0.01 ~ 188inch/min)
	C: 1 ~ 4800°/min
	feed/rev X, Z: 0.0001 ~ 8000.0000mm/rev (0.0001 ~ 4800.0000mm/rev)
Y: 0.0001 ~ 6000.0000mm/rev (0.0001 ~ 4800.0000mm/rev)	
	0.000001 ~ 50.00000inch/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
Variable lead threading	G34
Handle feed	Manual pulse generator 0.001/0.01/0.1mm° (per pulse)
Automatic acceleration / deceleration	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% (each 10%)
AI contouring control I	G5.1
Spindle override	50%~120% Set every 10%

■ Program memory		
Part program storage length / Number of registrable programs	2Mbyte Total 5120m	1000
Parts program editing	delete, insert, change	
Program number search	Standard	
Sequence number search	Standard	
Address search	Standard	
Program storage memory	Battery backup	
Background editing	Standard	
Call of sub-program in a memory card	Standard (Invoked by M200 / Not including memory card)	
Extended part program editing	Standard	

■ Operation and display	
Operation panel : Display	15-inch color LCD touch panel
Operation panel : Keyboard	Separate type MDI unit (QWERTY keyboard)

■ Programming assist functions	
Circular interpolation R programming	Standard
Direct drawing dimension programming 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 custom macro variables	Standard(After addition, #100 - #199, #500 - #999)
LUCK-BE 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	
Spindle rigid tapping	Standard
Spindle orientation	Standard(any angle is available within 360°, Control unit: 0.088°)
Milling rigid tapping	Standard
Polygon function	Standard

■ 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
Fan motor stop	Standard
Automatic light off	Standard(Switch on Power Saving Mode in NT Setting screen)
Automatic monitor off	Standard (Switchover on the iHMI setting monitor)





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