

WY-250L

NAKAMURA-TOME
PRECISION INDUSTRY CO.,LTD.

Ideal for Long
Workpieces

Innovative
Technology

~ Creating new values ~

WY-250L

A multitasking machine with opposed twin spindles, featuring a Y-axis on both upper and lower turrets as standard.
Cycle times are reduced by utilizing simultaneous machining on the L/R spindles with the upper and lower turrets.
Long bed specifications with an 8-inch class chuck. It accommodates a wide range of machining operations, including long workpieces.

- Milling and Y-axis standard equipped on upper and lower turrets
- Milling motor 5.5/3.7kW(op.)
- Milling spindle speed 6,000min⁻¹
- Tool capacity of up to 48 tools
- Cycle times are reduced by utilizing simultaneous machining on the L/R spindles with the upper and lower turrets.
- Large variety of software

S×2
Twin Spindle

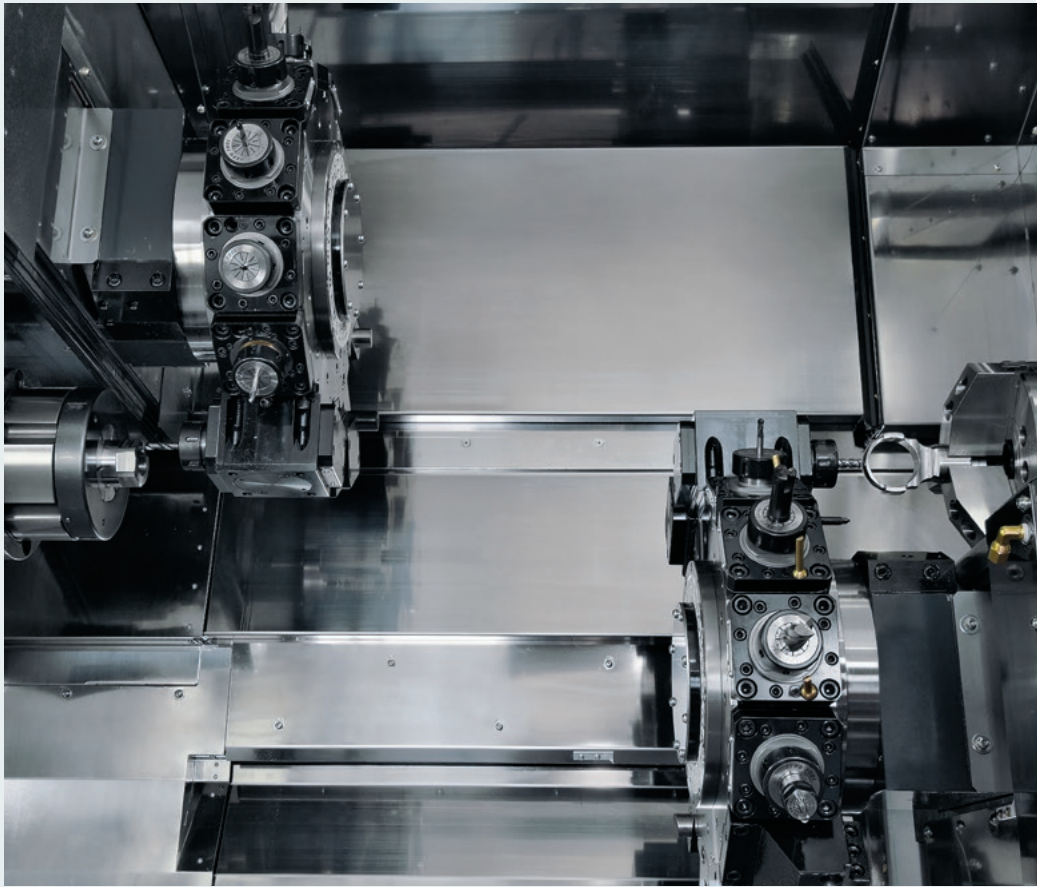
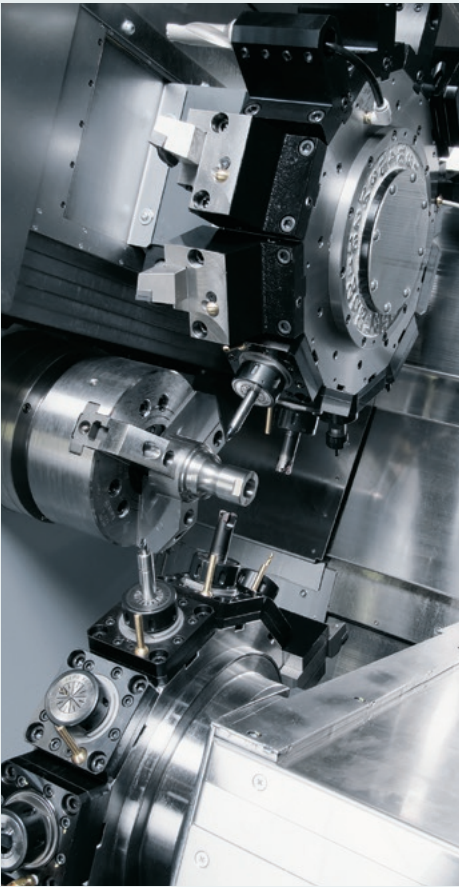
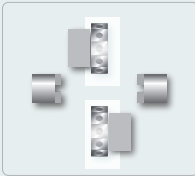
M×2
Milling Motor

B2
R-spindle

C×2
C-axes

Y×2
Y-axes

T×2
Double Turrets



Long Bed Design Ideal for Long Workpieces

L-spindle

Bar capacity $\phi 65\text{mm}$	
Standard	Option
Spindle motor $18.5/11\text{kW}$ $4,500\text{min}^{-1}$	Spindle motor $26/22\text{kW}^{*1}$ $4,500\text{min}^{-1}$

Bar capacity $\phi 71\text{mm}$	
Option	Option
Spindle motor $18.5/11\text{kW}$ $4,000\text{min}^{-1}$	Spindle motor $26/22\text{kW}^{*1}$ $4,000\text{min}^{-1}$

Bar capacity $\phi 80\text{mm}$	
Option	Option
Spindle motor $18.5/11\text{kW}$ $3,500\text{min}^{-1}$	Spindle motor $26/22\text{kW}^{*1}$ $3,500\text{min}^{-1}$

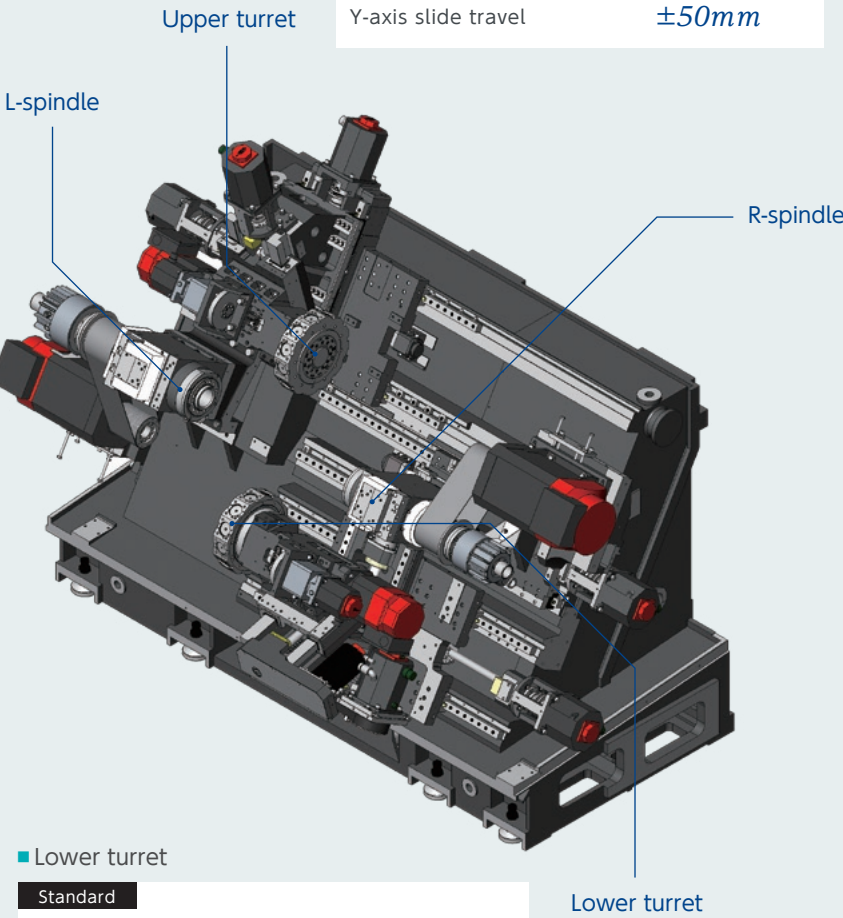
*1 R-spindle is automatically upgraded to 18.5/15kW

Milling and Y-axis standard
equipped on upper and lower turrets



Upper turret

Standard	
Type of turret head	<i>Dodecagon</i>
Number of milling stations / Number of indexing positions	<i>12/24</i>
Milling motor	<i>5.5/3.7kW</i> <i>6,000min⁻¹</i>
Y-axis slide travel	<i>$\pm 50\text{mm}$</i>

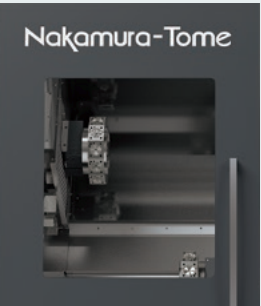


Lower turret

Standard	
Type of turret head	<i>Dodecagon</i>
Number of milling stations / Number of indexing positions	<i>12/24</i>
Milling motor	<i>5.5/3.7kW</i> <i>6,000min⁻¹</i>
Y-axis slide travel	<i>$-50, +20\text{mm}$</i>

Large window for
easy viewing of
the machining area

The door windows are
equipped with wipers
that keep the windows
clean.



R-spindle

Bar capacity $\phi 51\text{mm}$	
Standard	Option
Spindle motor $15/11\text{kW}$ $5,000\text{min}^{-1}$	Spindle motor $18.5/15\text{kW}^{*2}$ $5,000\text{min}^{-1}$

Bar capacity $\phi 65\text{mm}$	
Option	Option
Spindle motor $15/11\text{kW}$ $4,500\text{min}^{-1}$	Spindle motor $18.5/15\text{kW}^{*2}$ $4,500\text{min}^{-1}$

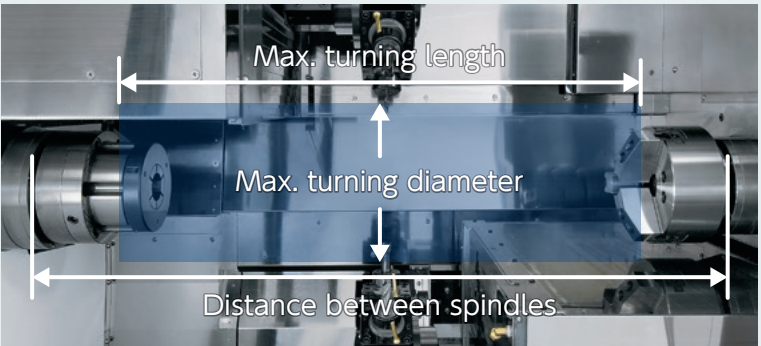
*2 L-spindle is automatically upgraded to 26/22kW

- Max. turning length *910mm*
- Max. turning diameter *$\phi 225\text{mm}$*
*L-spindle: $\phi 65, \phi 71$ specifications
- Bar capacity(L) *$\phi 65\text{mm}$*
(op. $\phi 71, \phi 80$)
- Distance between spindles *Max. 1,200mm*
Min. 255mm

NT SmartX
19 inch touch screen

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

Tool setter(op.)



Various Options to Meet our Customer's Needs.

Liquid level detection

Automatic fire extinguisher

Oil skimmer

High pressure coolant unit

Coolant temperature control unit

Coolant line filter

Signal light

Fire prevention damper

Mist collector

Chip conveyor(Side/Rear)

Chip bucket

Drill breakage detection

Coolant pipe above spindle

Fixed air blow

Internal spindle air/oil blow

Parts catcher type G

Parts catcher type A

Turret air/oil blow

Pneumatic parts ejector

HAN-BEI (in-process measuring system)

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

Gantry Loader

Option

GR-210 NEW



WS-442W *1	Type	Multi-layer Pallet
	Workpiece diameter	φ20~φ220mm
	Number of pallets	20
	Stack height	450mm
WS-445W *1	Type	Multi-layer Pallet
	Workpiece diameter	φ20~φ220mm
	Number of pallets	14
	Stack height	450mm
	Max. loading weight	40kg/Pallet

*1 There are 2 loading stations to shorten outboard service time.

GR-203II



WS-121	Type	Single-layer Pallet
	Workpiece diameter	φ20~φ80mm
	Number of pallets	30
WS-122	Type	Single-layer Pallet
	Workpiece diameter	φ20~φ80mm
	Number of pallets	60
WS-124	Type	Single-layer Pallet
	Workpiece diameter	φ20~φ80mm
	Number of pallets	120

WS-132	Type	Single-layer Pallet
	Workpiece diameter	φ20~φ150mm
	Number of pallets	10
	Max. loading weight	10kg/Pallet

WS-221	Type	Multi-layer Pallet
	Workpiece diameter	φ15~φ100mm
	Number of pallets	10
	Stack height	300mm
WS-231	Type	Multi-layer Pallet
	Workpiece diameter	φ20~φ150mm
	Number of pallets	10
	Stack height	300mm

WS-231	Type	Multi-layer Pallet
	Workpiece diameter	φ20~φ150mm
	Number of pallets	10
	Stack height	300mm
WS-231	Type	Multi-layer Pallet
	Workpiece diameter	φ20~φ150mm
	Number of pallets	10
	Stack height	300mm

Parts catcher type G

Option

Bar capacity			φ 65	φ 71	φ 80
Method			Gripper		
Part size	Diameter	mm	φ 65	φ 71	φ 80
	Length	mm	150		
	Weight	kg	3.0		
Ejecting method			Belt conveyor & Chute		

Parts catcher type A

Option

Bar capacity			φ 65	φ 71	φ 80
Method			Swing-in Bucket		
Part size	Diameter	mm	φ 71		φ 80
	Length	mm	150		
	Weight	kg	3.0		
Ejecting method			Chute		

Advanced Production System
NT SmartX



■ Powered by AI as standard equipment

- NT Thermo Navigator AI
- 3D Smart Pro AI

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

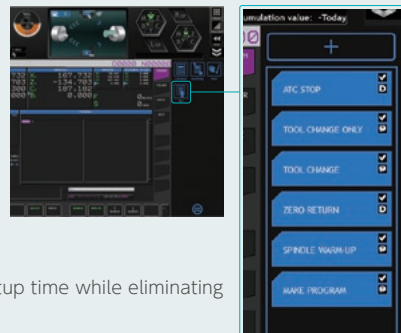
Digital Chuck Interlock

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.

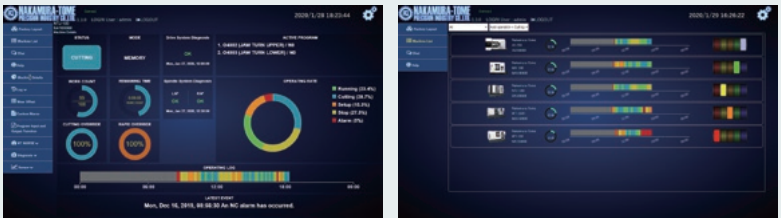
Reduce programming and setup time while eliminating input errors.



NT Smart Sign
Nakamura-Tome IoT software

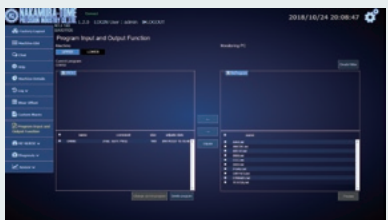
※Please refer to the NT Smart Sign exclusive catalog for details.

■ Monitoring



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

■ Data Input/Output

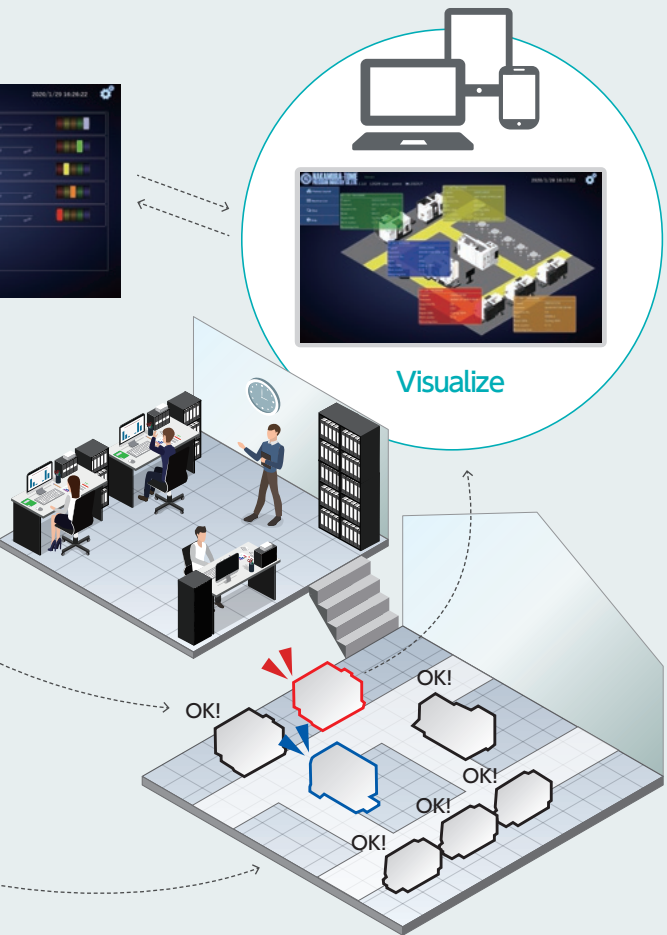


Input and output programs, tool data and other machine data from the monitoring PC.

■ Diagnosis



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



NT Thermo Navigator AI
Thermal Growth Compensation using AI.

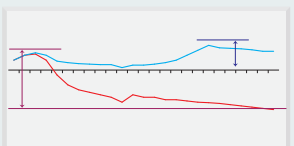
Compensation model built using AI machine learning.

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

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

Acquired Data analyzed with NT Thermo Navigator AI

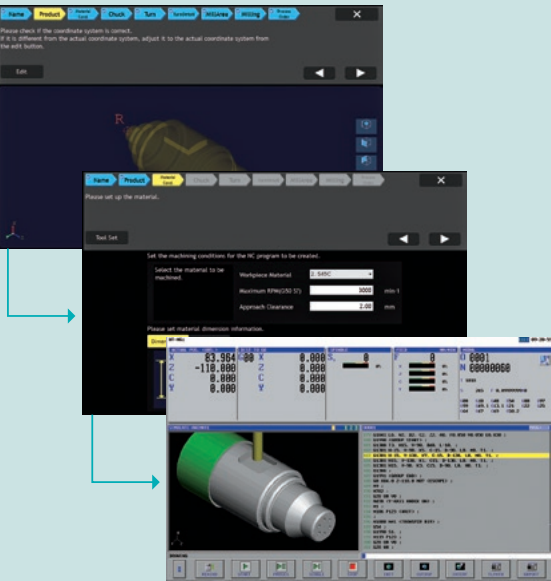
Feedback



Standard for NT SmartX

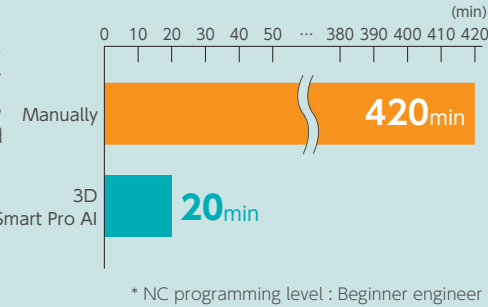
3D Smart Pro AI AI Analysis NC Programming Support Function

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.

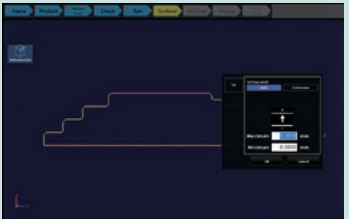


Operators can also set detailed machining methods.

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



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.



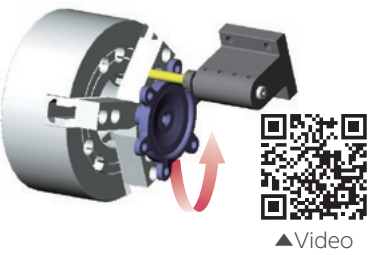
Tool Guide
If the tool configuration is incomplete, the AI analyzes the CAD model data and provide the necessary tool information.

NT WORK NAVIGATOR



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.



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.

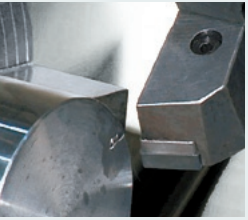
When the machine collides, there is no reason to panic.

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



Without Airbag

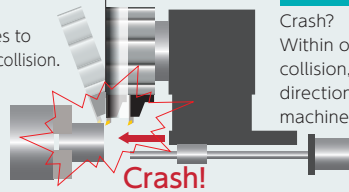
Machines will not stop immediately. The slide continues to move even after a collision.



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.

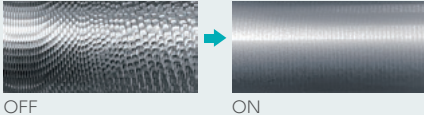
Barrier? Even with barrier function, machine collisions may occur



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

Chatter Canceller

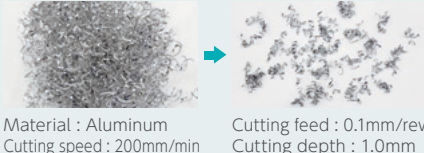
Reduce the chatter and vibration by changing the spindle speed up/down continuously during cutting. This function can be turned ON/OFF simply by M-code.



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

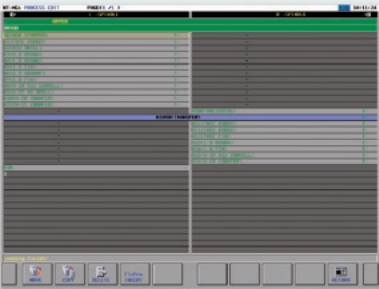
Oscillation cutting (op.)

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.

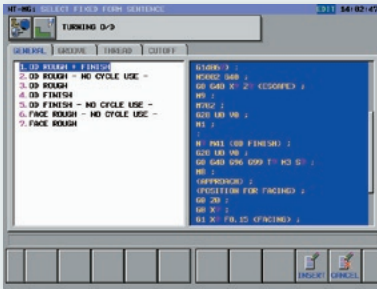


NT Manual Guide i (LUCK-BEI II)

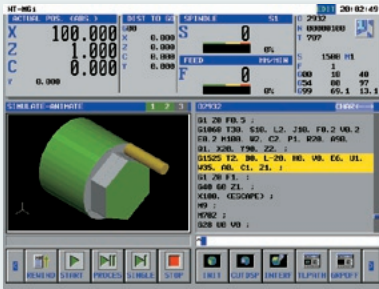
A programming guidance system with the ability to generate NC programs (ISO/EIA G-code programs) easily. Processes created in conversational mode can be cut, copied or pasted ensuring flexibility. Additionally, several cycles such as part-transfer cycle, requiring waiting M-codes, are readily made with 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.

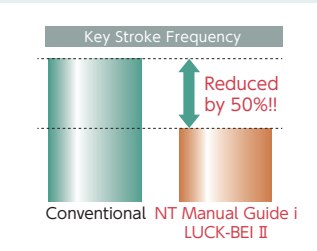


▲ Fixed-form sentence function
NT Manual Guide i contains more than 300 types of fixed form sentences. Operator can select these fixed form sentences for the program from a menu screen.



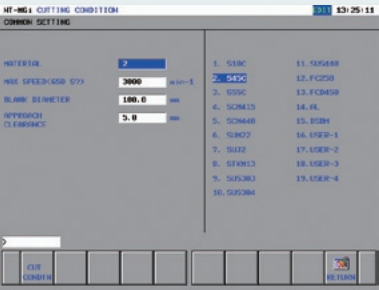
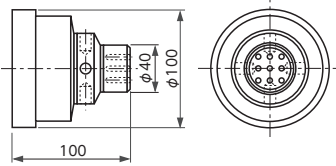
▲ Simulation
Accurate simulation of turning and milling operations using a 3D solid model.

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 i version.

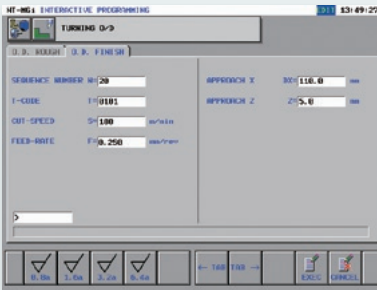


Automatic Cutting-Condition Setting Function

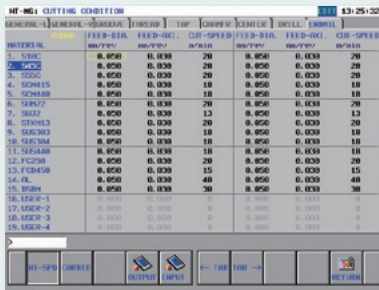
By setting the material type and required surface roughness, cutting conditions are automatically generated. These can be also changed depending on customer's experience.



By selecting the material, cutting conditions are automatically input.

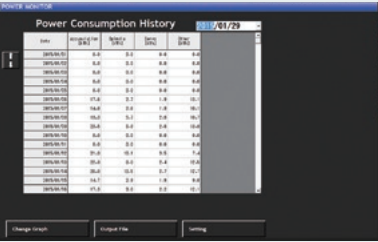
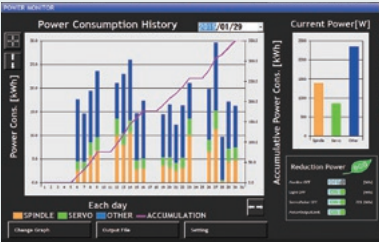
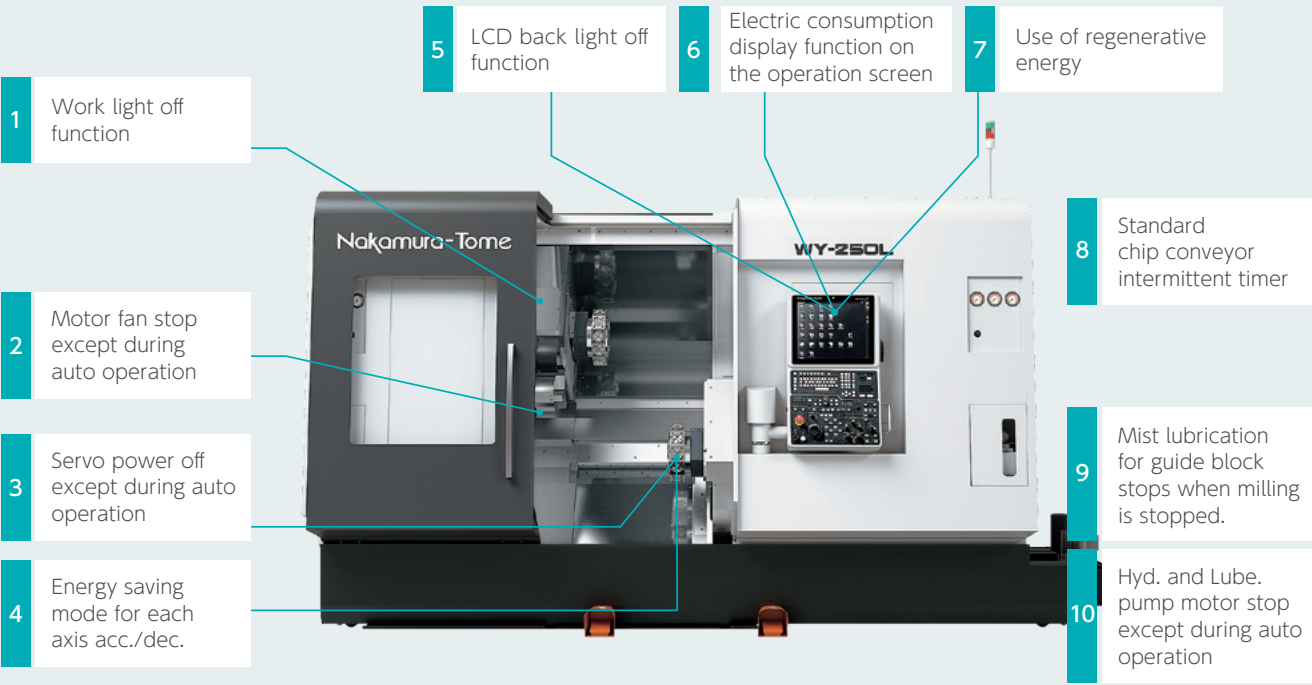


By setting the surface roughness, machining conditions are automatically input



Cutting conditions: End mill

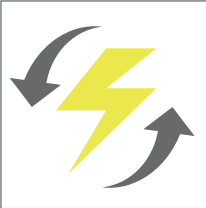
Nakamura-Tome is committed to the environment as an eco-friendly manufacturer.



Power consumption monitoring screen

The monitor, lighting, and servo can be set to automatically turn off from the power saving setting screen. The amount of power consumption and the amount of power reduction by power saving settings are displayed.

Use of regenerative energy



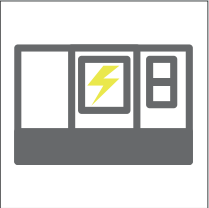
Amount of electricity recovered approx. 13.7%

* For WY-100 II

Addition of ECO mode function to NT SmartX



Improvement of power control system



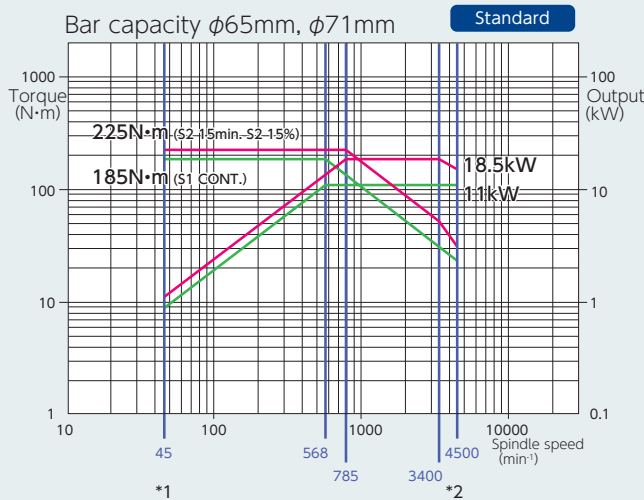
Cut down power consumption by approx. 74%

* When ECO mode is enabled

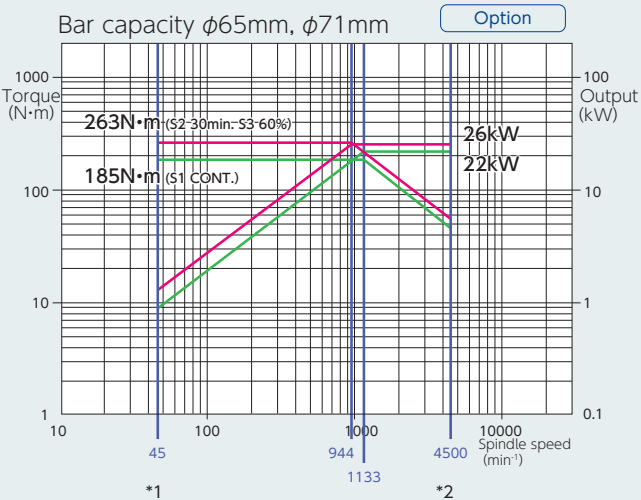
Torque/Output Chart

L-spindle motor

Spindle motor 18.5/11kW

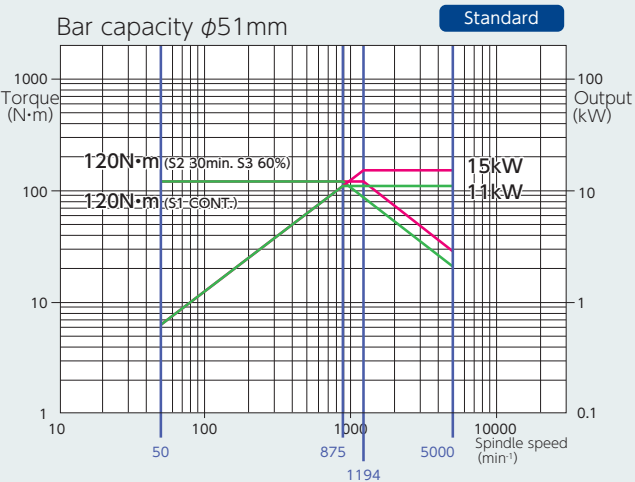


Spindle motor 26/22kW

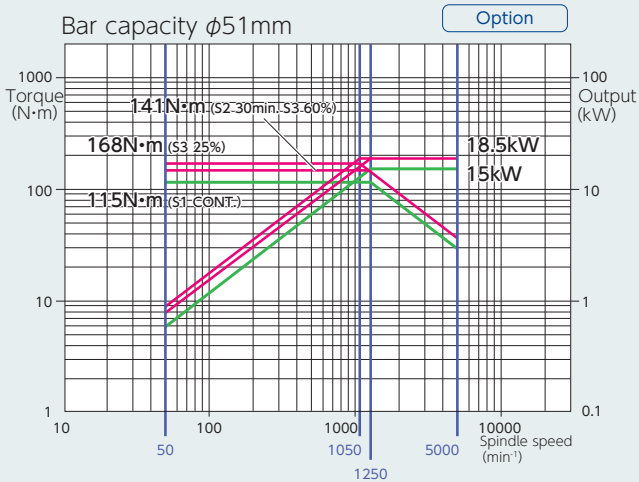


R-spindle motor

Spindle motor 15/11kW

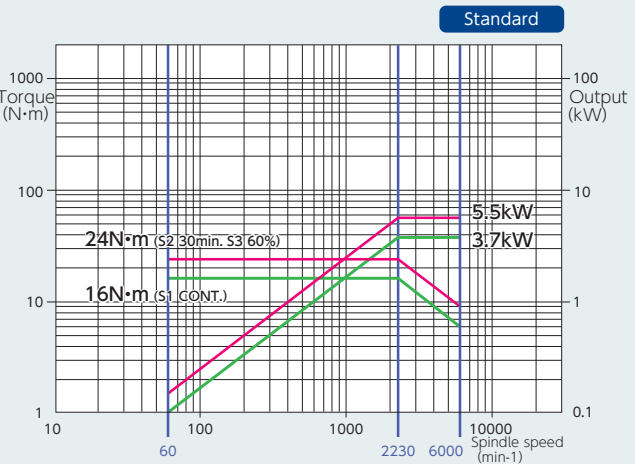


Spindle motor 18.5/15kW



Milling motor

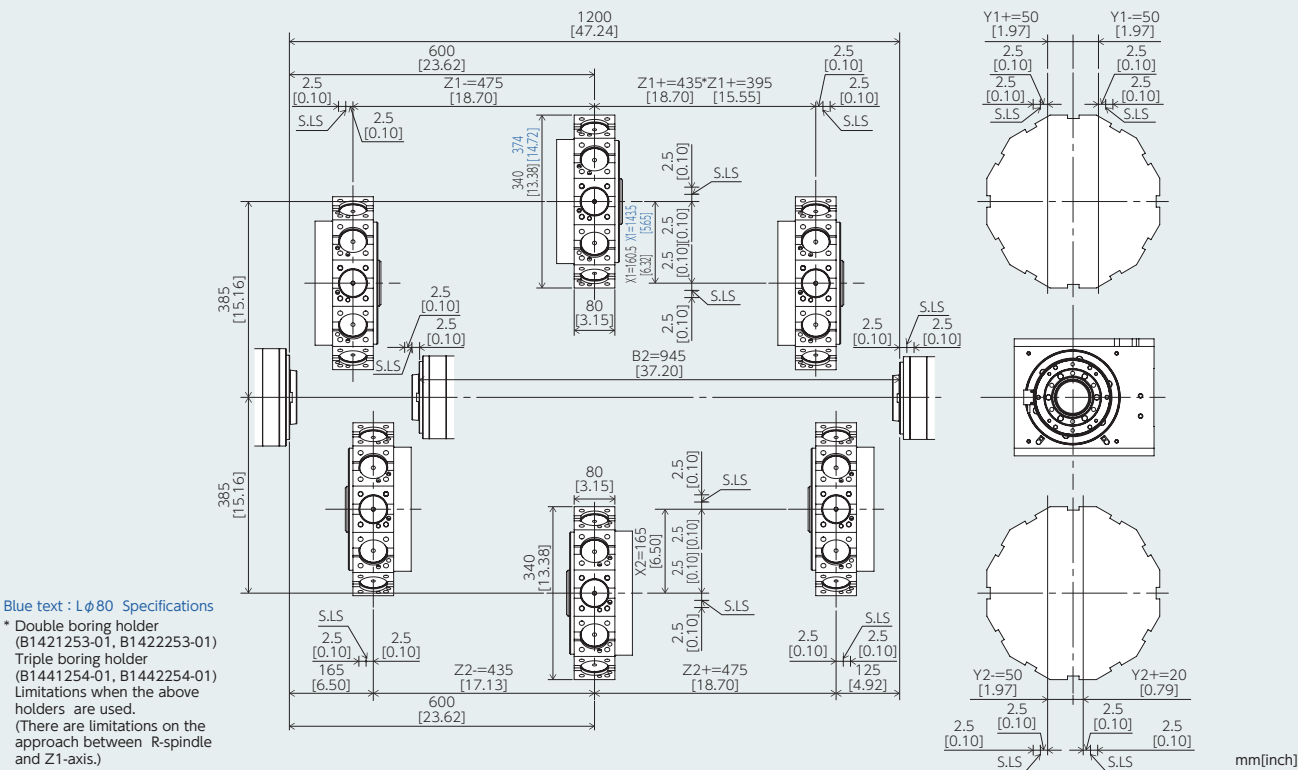
Spindle motor 5.5/3.7kW



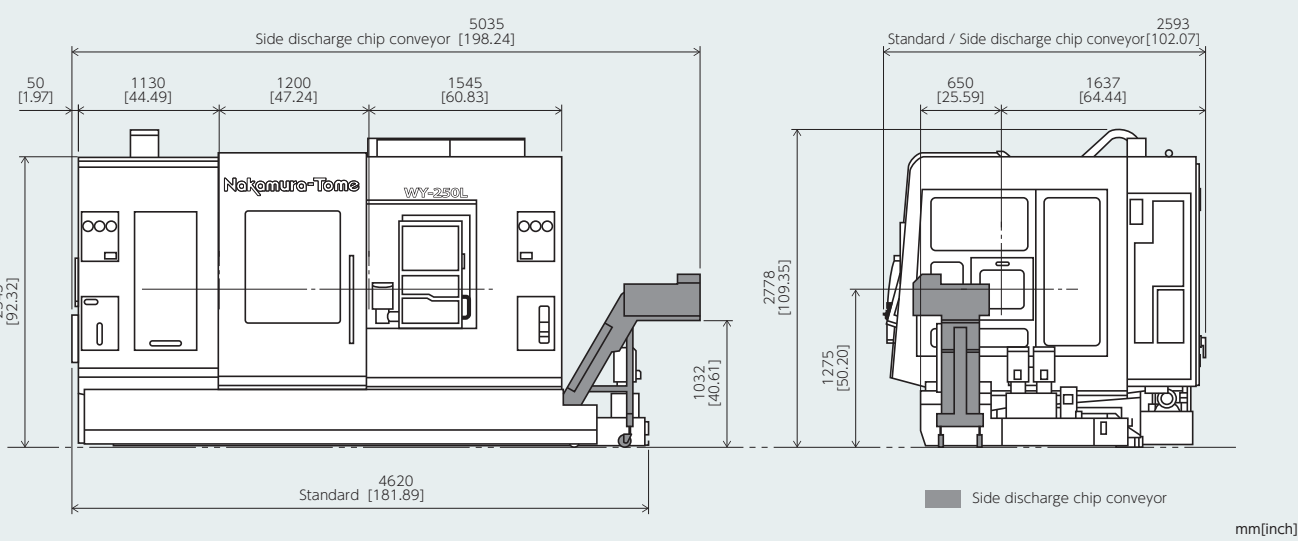
*1 $\phi 65$: 45min⁻¹
 $\phi 71$: 40min⁻¹

*2 $\phi 65$: 4,500min⁻¹
 $\phi 71$: 4,000min⁻¹

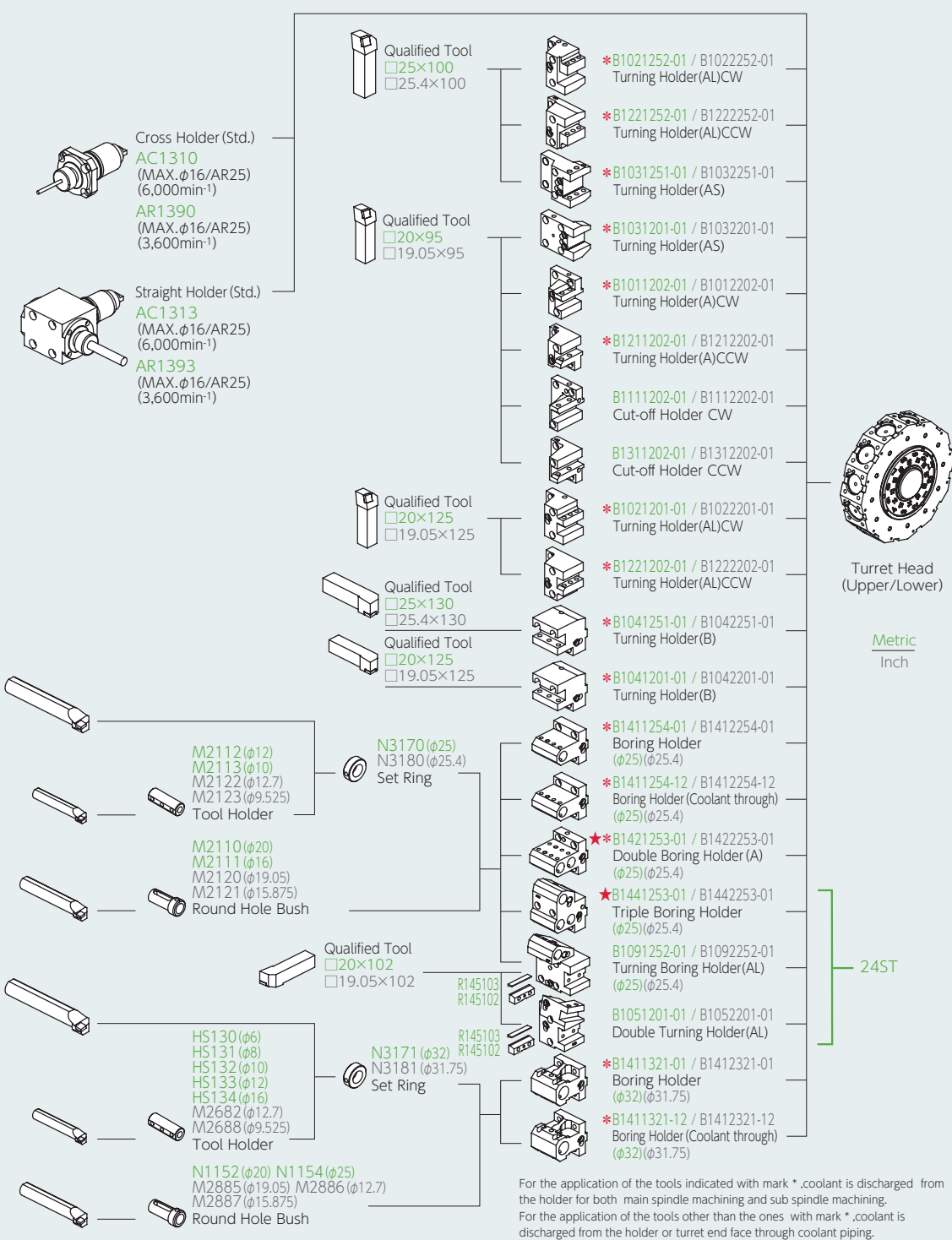
Travel Range



Machine Dimensions



Tooling System



■ Capacity		φ51	φ65	φ71(op.)	φ80(op.)
Max. turning diameter		225mm			180mm
Max. turning length		910mm			
Distance between spindles		max. 1,200mm / min. 255mm			
Bar capacity	L	-	φ65mm	φ71mm(op.)	φ80mm(op.)
	R	φ51mm	φ65mm(op.)	-	-
Chuck size	L	-	8"	8"	8"
	R	6"	6"	-	-

■ Axis travel

X1-axis slide travel	160.5mm	143.5mm
X2-axis slide travel	165mm	
Z1-axis slide travel	910mm	
Z2-axis slide travel	910mm	
Y1-axis slide travel	±50mm	
Y2-axis slide travel	-50mm, +20mm	
B2-axis slide travel	945mm	

■ Rapid feed

X-axis rapid feed rate	18m/min
Z-axis rapid feed rate	40m/min
Y-axis rapid feed rate	10m/min
B2-axis rapid feed rate	40m/min

■ L-spindle

Spindle speed	-	4,500min ⁻¹	4,000min ⁻¹	3,500min ⁻¹
Spindle speed range	-	Stepless	Stepless	Stepless
Spindle nose	-	A2-6	A2-6	A2-8
Hole through spindle	-	80mm	80mm	90mm
I.D. of front bearing	-	110mm	110mm	120mm
Hole through draw tube	-	66mm	72mm	81mm

■ R-spindle

Spindle speed	5,000min ⁻¹	4,500min ⁻¹	-	-
Spindle speed range	Stepless	Stepless	-	-
Spindle nose	A2-5	A2-6	-	-
Hole through spindle	63mm	80mm	-	-
I.D. of front bearing	90mm	110mm	-	-
Hole through draw tube	52mm	66mm	-	-

■ C-axis

Least input increment	0.001°
Least command increment	0.001°
Rapid speed	600min ⁻¹
Cutting feed rate	1-4,800° /min
C-axis clamp	Disk clamp
C-axis connecting time	1.5s

■ Upper/Lower turret	φ51	φ65	φ71(op.)	φ80(op.)
Type of turret head	Dodecagonal drum turret			
Number of indexing positions	24			
Tool size (square shank)	□25mm			
Tool size (round shank)	φ32mm			

■ Milling

Rotary system		Individual rotation
Milling spindle speed		6,000min ⁻¹
Spindle speed range		Stepless
Number of milling stations		12
Holder type and Tool size	Straight holder	φ1mm ~ φ16mm
	Cross holder	φ1mm ~ φ16mm

■ Drive motor

L-spindle	18.5/11kW
	26/22kW (op. R-spindle is automatically upgraded to 18.5/15kW)
R-spindle	15/11kW
	18.5/15kW (op. L-spindle is automatically upgraded to 26/22kW)
Milling	5.5/3.7kW

■ General

Height	2,395mm
Floor space (W × D)	4,620mm × 2,593mm
Machine weight (incl. control)	13,000kg

■ Power supply

Power supply	52.9kVA
Air supply	400NL/min, 0.5 ~ 0.7MPa

● 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.

■ Items

Control type	FANUC 32i-B (2-PATH)
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■ Controlled axes

Controlled axes	9 axes
Simultaneously controlled axes	Upper : 4 axes (X1, Z1, C1(C2), Y1) Lower : 4 axes (X2, Z2, C2(C1), Y2, B2)

■ Input command

Least input increment	0.001mm/0.0001inch (diameter for X-axis), 0.001°
Least command increment	X : 0.0005mm, Z : 0.001mm, C : 0.001° , B2: 0.001mm, Y : 0.001mm
Max. programmable dimension	±999999.999mm / ±39370.0787inch, ±999999.999deg
Absolute/Incremental programming	X, Z, Y, C, B2(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 : 1-8000mm/min, 0.01-315inch/min (1-4800mm/min, 0.01-188inch/min) Z : 1-8000mm/min, 0.01-315inch/min (1-4800mm/min, 0.01-188inch/min) C : 1-4800° /min Y : 1-8000mm/min, 0.01-315inch/min (1-4800mm/min, 0.01-188inch/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
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%)

■ Program memory

Part program storage length/ Number of registrable programs	256kbyte Total 640m	500
	512kbyte Total 1280m	1000(op.)
	1Mbyte Total 2560m	1000(op.) 2000(op.)
	2Mbyte Total 5120m	1000(op.) 4000(op.)
	4Mbyte Total 10240m	1000(op.) 4000(op.)
	8Mbyte Total 20480m	1000(op.) 4000(op.)
Part program editing	delete, insert, change	
Program number search	Standard	
Sequence number search	Standard	
Address search	Standard	
Tool offset pairs	99 + 99	
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 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
Axis recomposition	Standard
Sub program	Standard
Balance cut	G68, G69
Custom macro	Standard(common variables #100- #149, #500-#549)
Additional customer macro variables	Standard(After addition, #100-#199, #500-#999)
FS15 tape format	Standard
Luck-bei II/NT Manual Guide i	Standard
Abnormal load detection function	Standard
NT WORK NAVIGATOR	Standard(not including contact bar)
NT NURSE	Standard
NT Machine Simulation	Standard

■ Machine support functions

Rigid tapping	Standard
Spindle synchronised control	Standard
C-axis synchronised control	Standard
Spindle orientation	Standard



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