WT-150V

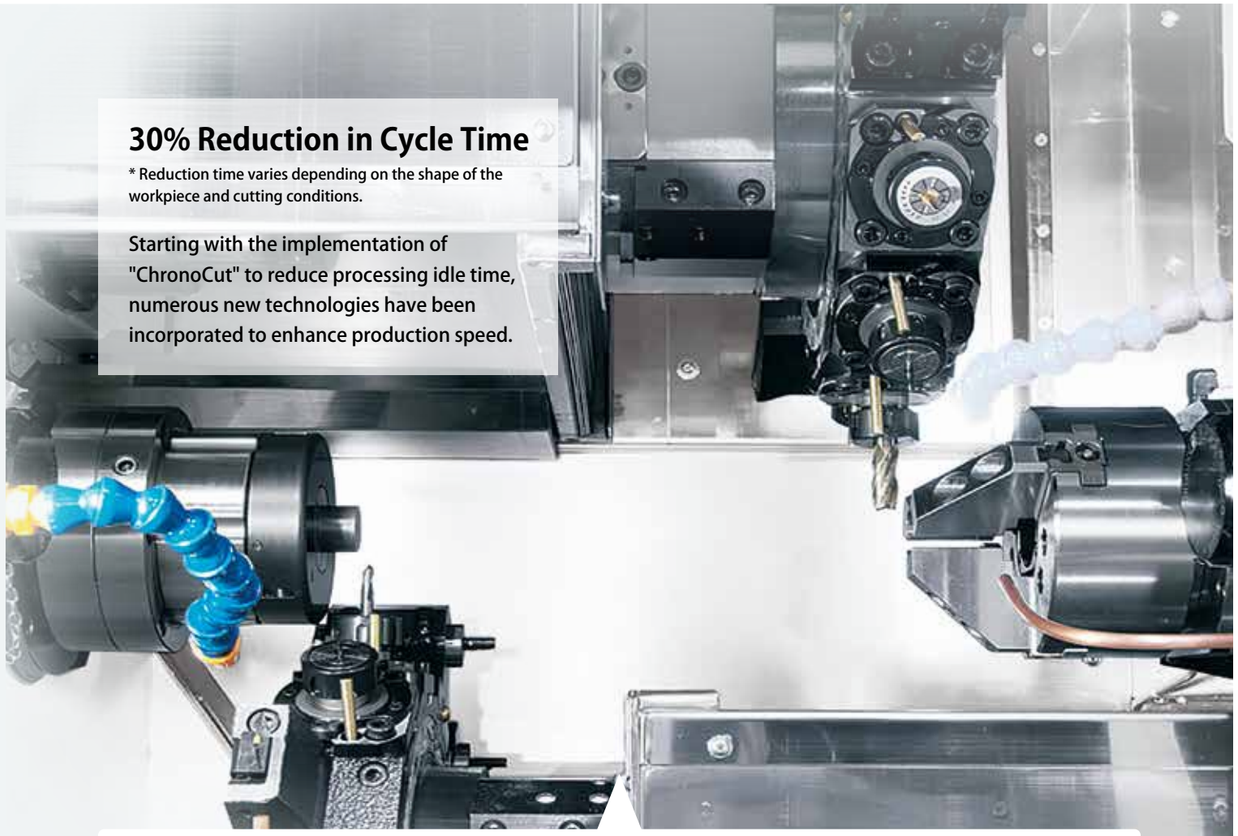
NAKAMURA-TOME
PRECISION INDUSTRY CO.,LTD.

Faster than the fastest

Innovative Technology
～Creating new values～

WT-150V

A Nakamura-Tome standard machine equipped with upper and lower turrets and an opposed dual-spindle configuration. Cycle times are shortened through simultaneous machining with the L/R spindles and upper/lower turrets.
A large variety of software and a compact installation footprint meet a wide range of production requirements.



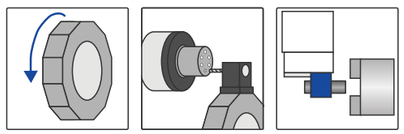
30% Reduction in Cycle Time

* Reduction time varies depending on the shape of the workpiece and cutting conditions.

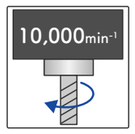
Starting with the implementation of "ChronoCut" to reduce processing idle time, numerous new technologies have been incorporated to enhance production speed.

ChronoCut

A unique function by Nakamura-Tome designed to reduce idle time. This new software minimizes idle time during manufacturing without compromising accuracy, even without any changes to the cutting conditions.

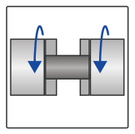


- High-speed indexing
- High-speed spindle synchronization
- Execution of multiple M-codes within the same block
- High-speed rigid tapping
- Reduction of PC-G unloading time, etc.



UP Machining conditions

By improving the machining capabilities of the milling speed, torque, and more, the machine achieves high performance under demanding conditions.



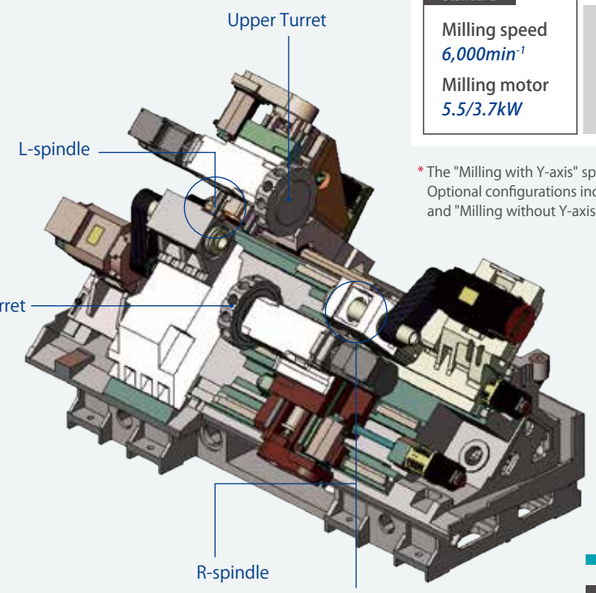
UP Acceleration / Deceleration

The acceleration and deceleration during starting and stopping have been improved, enabling quick attainment to the maximum speed.

Cycle Times are Faster Thanks to Simultaneous Machining with the L/R Spindles and Upper/Lower Turrets.

■ L-spindle

Standard	Option
Bar capacity *φ51mm (A2-5)*	Bar capacity *φ65mm (A2-6)*
Spindle speed *5,000min⁻¹*	Spindle speed *4,500min⁻¹*
Spindle motor *15/11kW*	Spindle motor *15/11kW*



■ Lower turret

Number of milling stations / Number of indexing positions 12 / 24

Standard	Option
Milling speed *6,000min⁻¹*	Milling speed *10,000min⁻¹*
Milling motor *5.5/3.7kW*	Milling motor *5.5/3.7kW*

■ Upper turret

Number of milling stations / Number of indexing positions 12 / 24

Standard

Y-axis slide travel ±35mm

Standard	Option
Milling speed *6,000min⁻¹*	Milling speed *10,000min⁻¹*
Milling motor *5.5/3.7kW*	Milling motor *5.5/3.7kW*

* The "Milling with Y-axis" specification is standard. Optional configurations include "Without Milling" and "Milling without Y-axis."

■ R-spindle

Standard

Bar capacity *φ51mm (A2-5)*

Spindle speed *5,000min⁻¹*

Spindle motor *11/7.5kW*

■ Tailstock (op.)

Option

Driving system
NC control servo-driven type

Quill taper
MT-3 (Built-in center) / MT-4 (Rotating center)

Range of thrust force
— 3.9kN

Greater Machining Flexibility with Upper and Lower Turrets

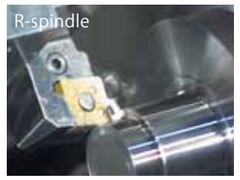
Balancing left/right machining, reducing cycle times, and optimizing processes—we deliver the ideal machining performance our customers envision.

Stable cutting capacity ensured

■ Metal Removal Rate **432mL/min**

Upper Turret

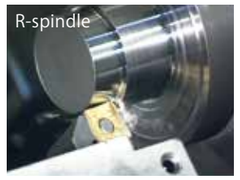
Cutting sectional area	*3.6mm²*
Cutting depth	*6mm*
Feed	*0.6mm/rev*
Spindle speed	*1,270min⁻¹*
Material	*S45C (JIS)*



Cutting sectional area	*2mm²*
Cutting depth	*5mm*
Feed	*0.4mm/rev*
Spindle speed	*1,270min⁻¹*
Material	*S45C (JIS)*

Lower Turret

Cutting sectional area	*3.3mm²*
Cutting depth	*6mm*
Feed	*0.55mm/rev*
Spindle speed	*1,270min⁻¹*
Material	*S45C (JIS)*

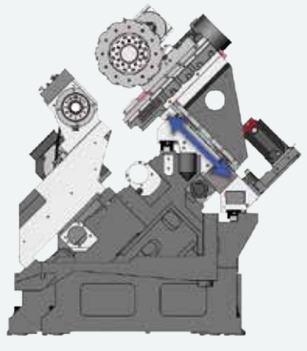


Cutting sectional area	*2mm²*
Cutting depth	*5mm*
Feed	*0.4mm/rev*
Spindle speed	*1,270min⁻¹*
Material	*S45C (JIS)*

* These data may change depending on actual cutting and environmental conditions.

High rigidity Y-axis slide

The Upper machine-structure was designed with the Y-axis in mind. High rigidity of the machine ensures maximum stability during heavy duty turning and milling with full power.



Parts Catcher Type G

Option

		φ51	φ65
Method		Swing ／ Gripper	
Part size	Diameter (mm)	φ12～51	φ12～65
	Length (mm)	12～150	
	Weight (kg)	3.0	
Ejecting method		Belt conveyor & Chute	

Advanced Production System
NT SmartX

Setup Support
- Status Screen
- Setup Screen
- Geometry Navigator (op.)
- 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
- Protona

Machining Support
- NT Thermo Navigator AI
- Warm-Up Function
- NT NURSE
- NT WORK NAVIGATOR
- Chatter Canceller
- Oscillation Cutting (op.)
- Triangle Cut (op.)

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

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

Customer Support
- NT Update

■ ChronoCut

Full version included as standard

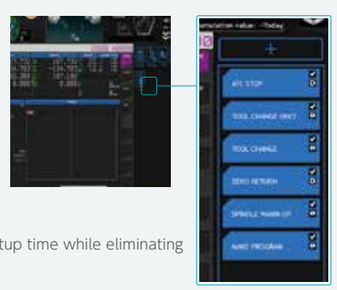
Digital Chuck Interlock

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

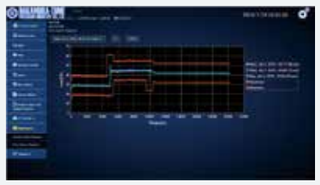
■ Monitoring

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

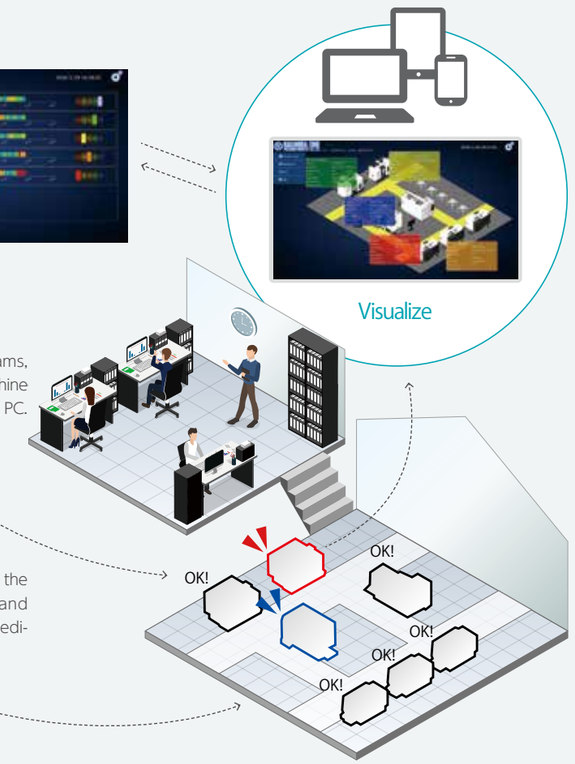
■ Data Input/Output

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

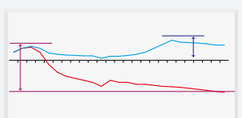
Standard for NT SmartX

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.

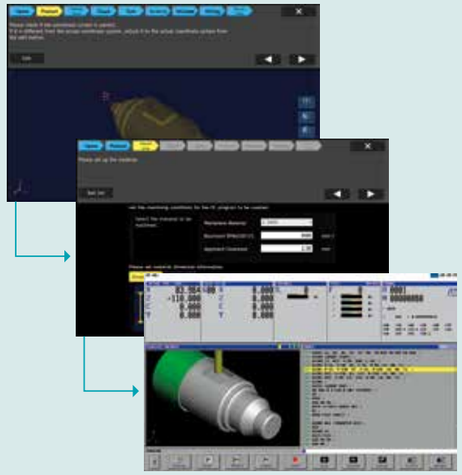


— Pre-correction thermal displacement data
— Thermal displacement data after correction

3D Smart Pro AI

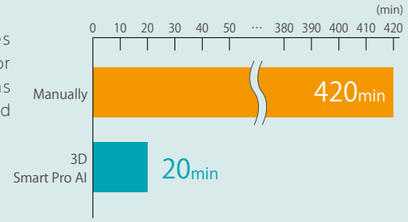
AI Analysis NC Programming Support Function

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.

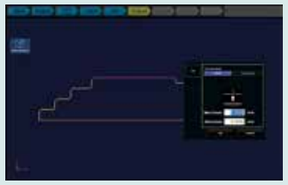
It drastically reduces man-hours required for creating NC programs and improves set up and production efficiency.



* 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

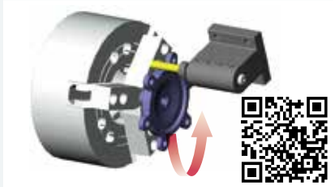
If the tool configuration is incomplete, the AI analyzes the CAD model data and provide the necessary tool information.

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

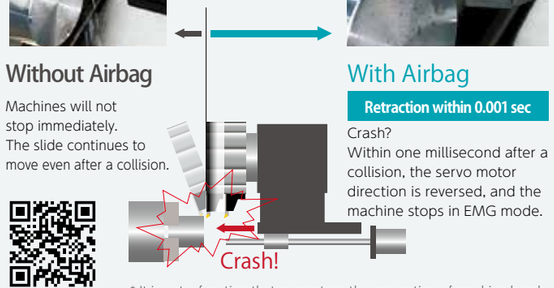
Airbag (Overload detection)

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

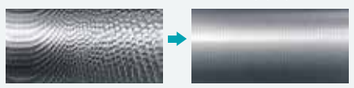


▲Video

* 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

Protona Conversational NC Programming Software

Protona - Become a "Pro" in NC Programming with Ease, Reliable, and Fast.

Compared to conventional conversational NC programming tools, Protona offers a simpler and more intuitive user experience.
Even beginners can create professional-quality NC programs while keeping learning time to a minimum.

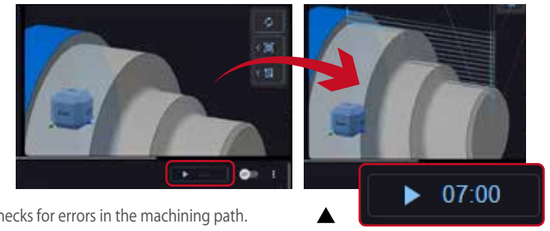
Guided Interface

Create NC programs step by step through a guided workflow.
Clear visuals and text explanations make it easy to follow—even for users with no prior experience.

▼ Guidance appear when hovering over input fields.

Estimated Machining Time

Click the ▶ (Play) button to run a simulation and view the estimated machining time ideal for layout planning and quoting.



Displays estimated machining time and checks for errors in the machining path. ▲

Easy Process Editing

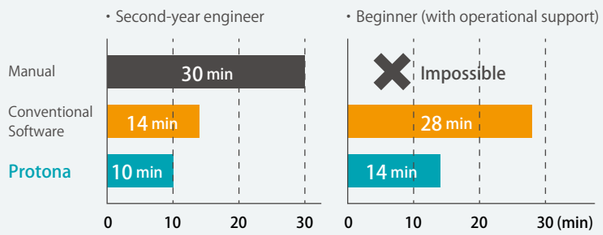
Each machining process can be easily rearranged via drag and drop. The machining time for each process is displayed, allowing you to fine-tune the time balance and create programs just the way you want.

G-codes and M-codes are automatically updated when process are moved between channels.

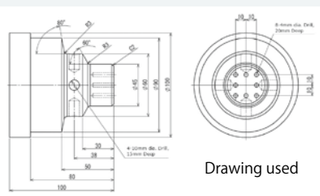
A feature unique to multitasking machines!

10 Points

1. Intuitive Programming
2. Guided Interface
3. Automatic Cutting Conditions
4. Automatic Coordinate Calculation
5. Automatic Approach Generation
6. Real-Time Geometry and Toolpath Display
7. Estimated Machining Time
8. Easy Process Editing
9. No NC Code Conversion Required
10. Built-In Tutorials



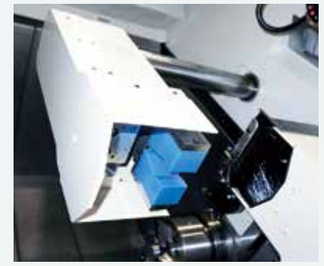
Both were able to complete their programs faster using Protona.



Drawing used

Various Options to Meet our Customer's Needs.

GR-203 High-Speed
* The image is of NTY3-100.



Parts Catcher Type G

Parts Catcher Type A

Bar feeder

Oil skimmer

Han-Bei (In-process measuring system)

Side/Rear discharge chip conveyor

Tool setter

Fire protection damper

Duct for oil mist collector

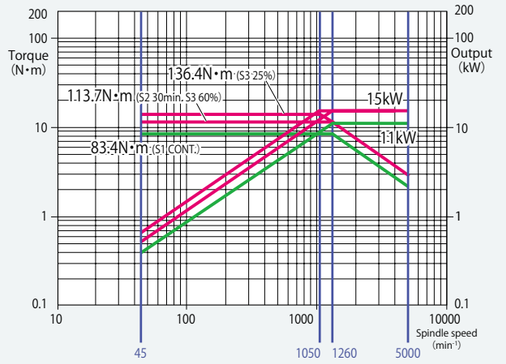
And many others.
For items not listed, please feel free to contact your Nakamura-Tome representative.

Torque/Output Chart

L-spindle motor — Standard

Bar capacity φ51
15/11kW

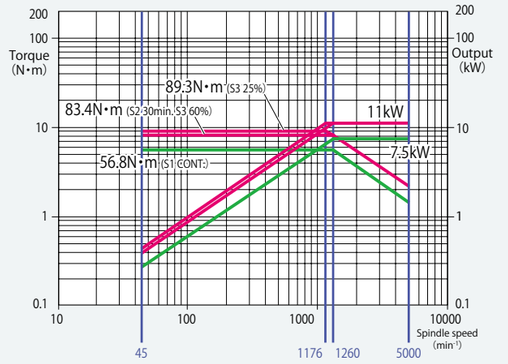
L-spindle／Max Rotational Speed : 5,000min^{-1}



R-spindle motor — Standard

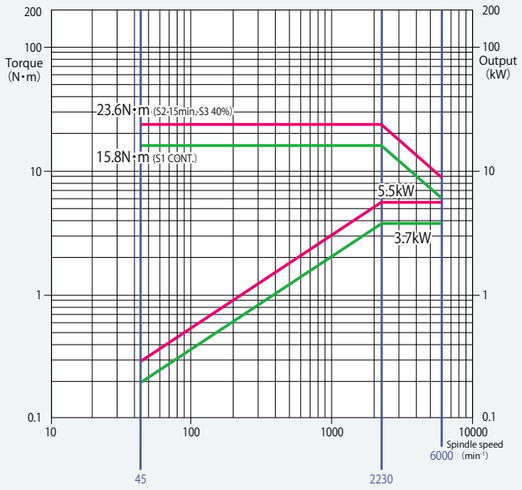
Bar capacity φ51
11/7.5kW

R-spindle／Max Rotational Speed：5,000min^{-1}



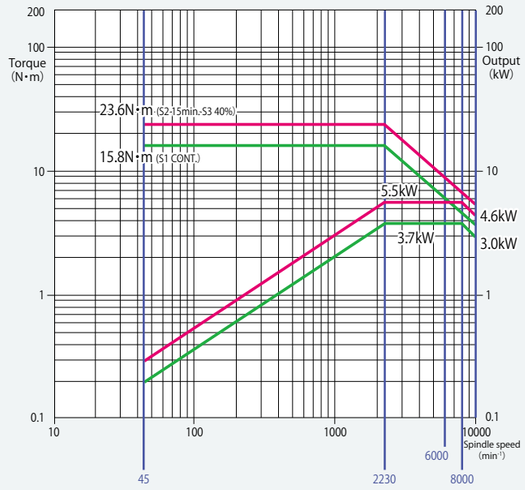
Milling motor — Standard

Max Rotational Speed：6,000min^{-1}



Milling motor — Option

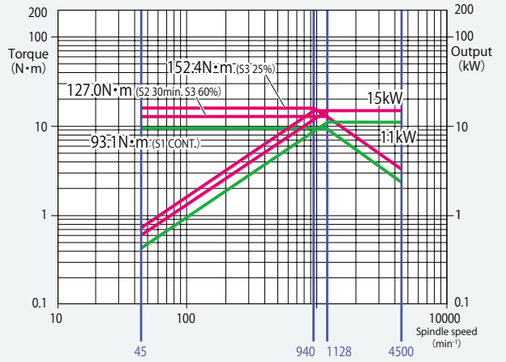
Max Rotational Speed：10,000min^{-1}



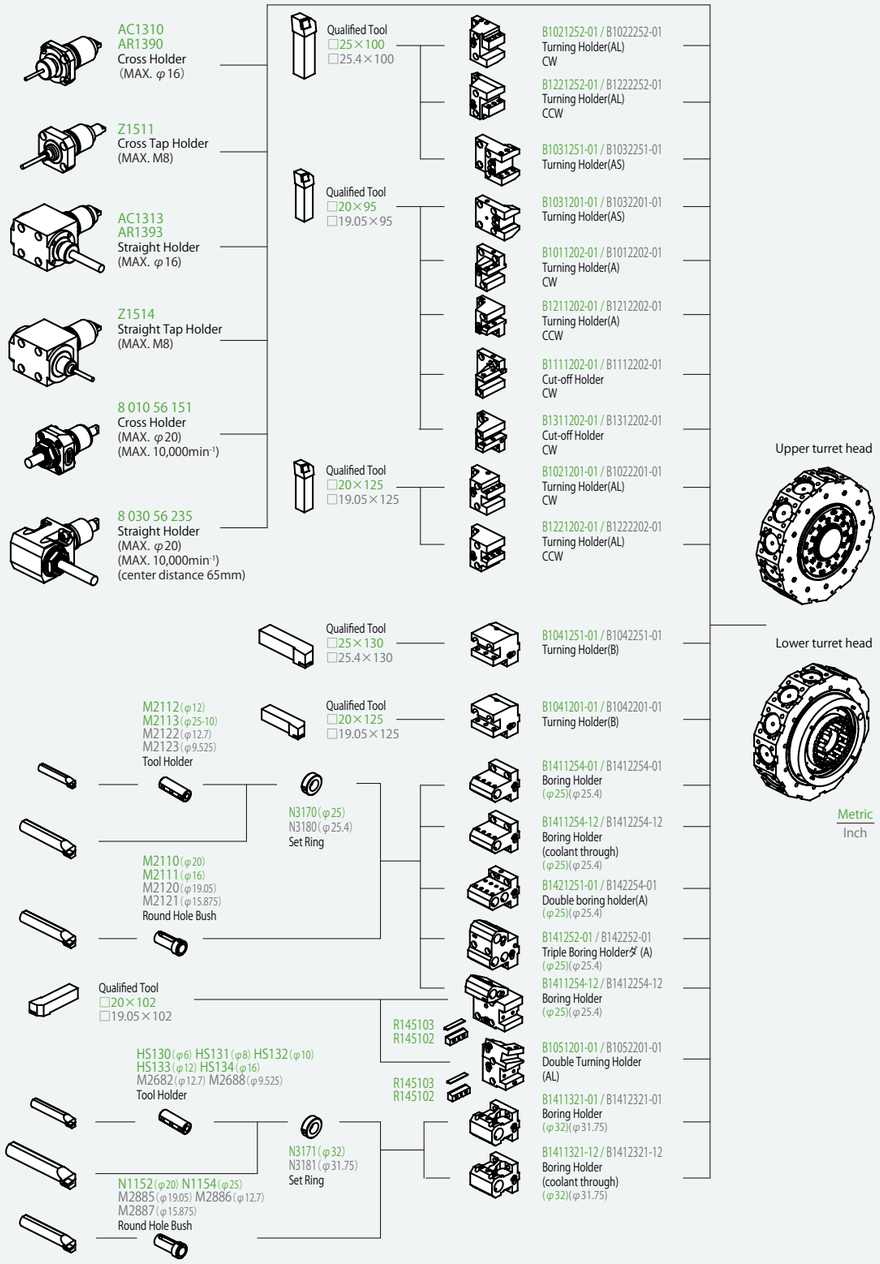
L-spindle motor — Option

Bar capacity φ65
15/11kW

L-spindle／Max Rotational Speed：4,500min^{-1}

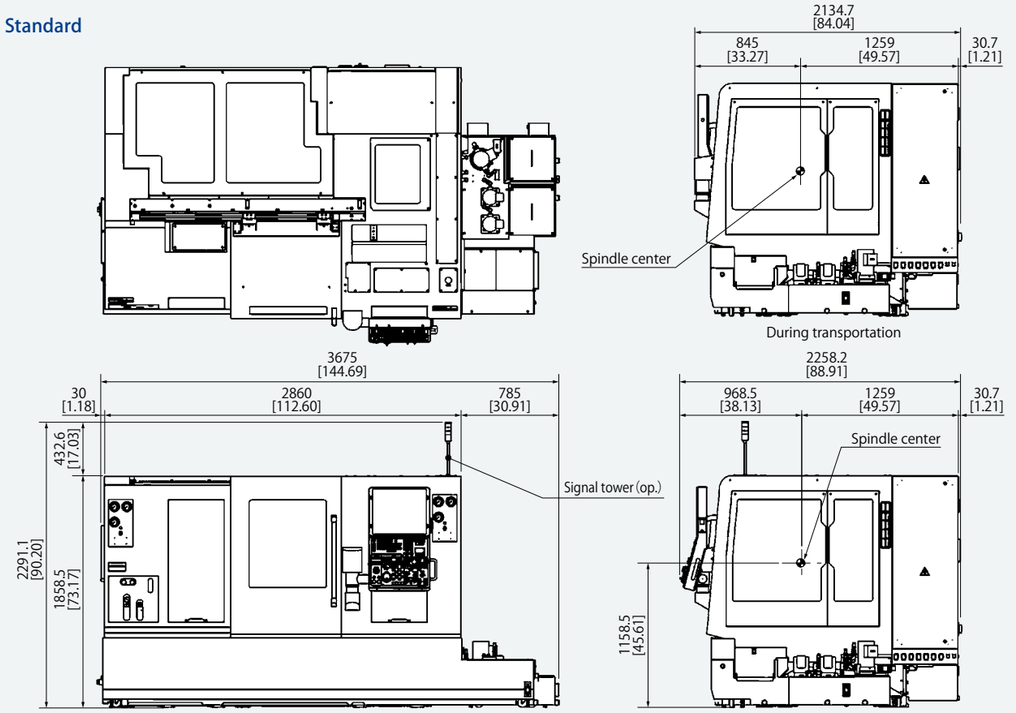


Tooling System

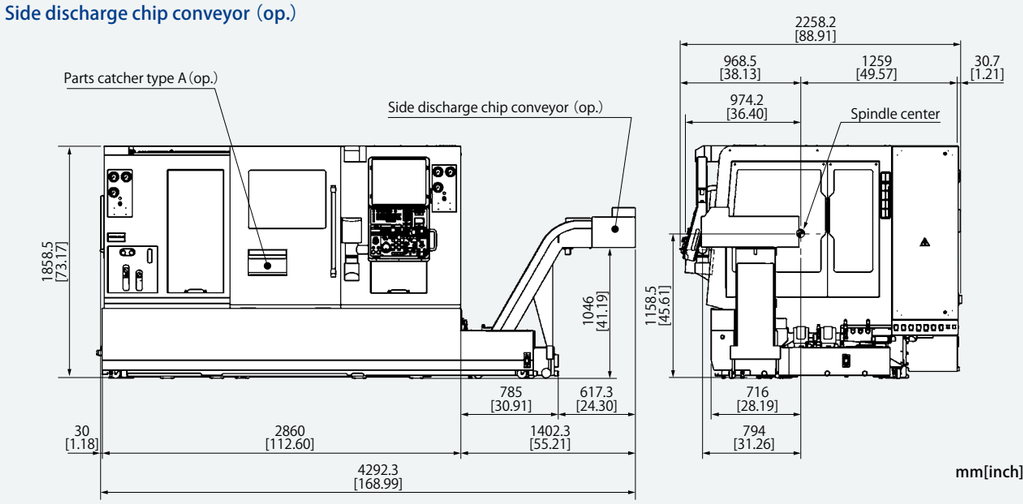


Machine Dimensions

Standard



Side discharge chip conveyor（op.）



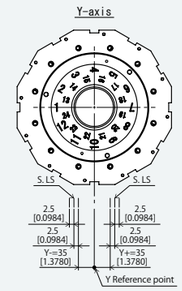
mm[inch]

Travel Range ／ Tool Interference ／ Maximum Tool Diameter

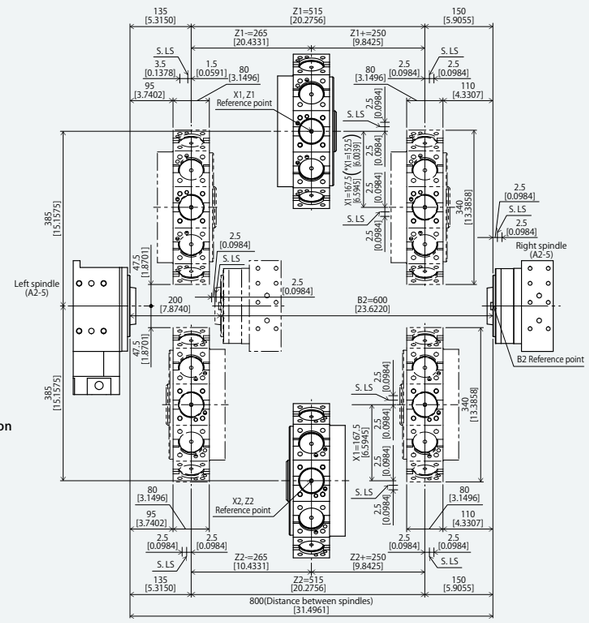
Travel Range

R-spindle specification

φ65mm L-spindle available



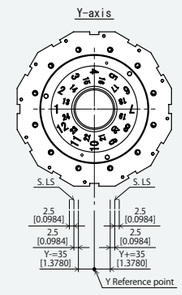
* For L-spindle φ65 specification



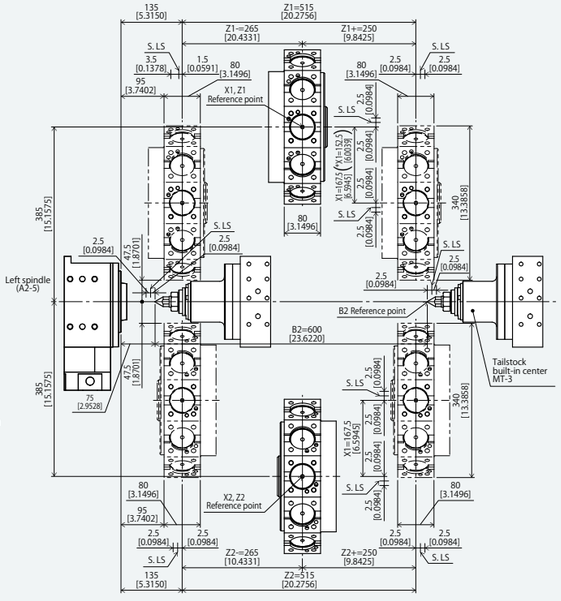
mm[inch]

Tailstock specification (op.)

φ65mm L-spindle available

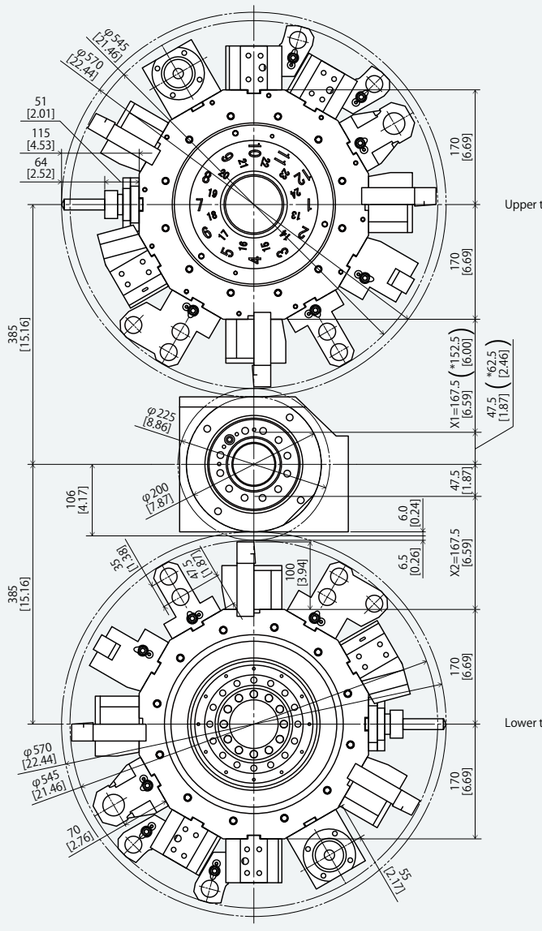


* For L-spindle φ65 specification



mm[inch]

Tool Interference

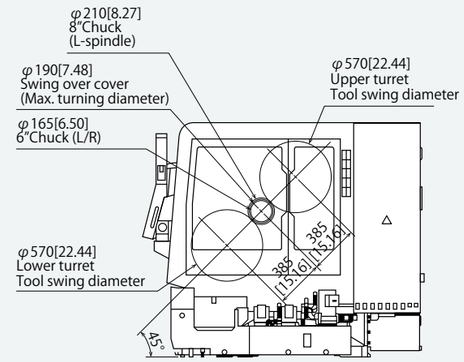


mm[inch]

* For L-spindle φ65 specification

Note on workpiece transfer limitations:
If the tool mounted on an indexing station of the lower turret has a projection length or holder height that exceeds the tool swing diameter of φ545, it cannot pass through during workpiece transfer.

Maximum Tool Diameter



mm[inch]

Note: There are tool swing diameter limitations during workpiece transfer.
For details, please refer to the "Tool Interference" diagram.

■ Capacity

	φ51	φ65 (op. only L)
Max. turning diameter	190mm	
Standard turning diameter	170mm	
Distance between spindles	max.800mm / min.200mm	
Max. turning length	515mm	
Bar capacity	φ51mm	φ65mm
Chuck size	6″, 8″ *1	

■ Axis travel

X1 / X2 axis slide travel	167.5mm / 167.5mm	152.5mm / 167.5mm
Z1 / Z2 axis slide travel	515mm / 515mm	
Y-axis slide travel *2	±35mm	
B2-axis slide travel	600mm	
X-axis rapid feed rate	20m/min	
Z-axis rapid feed rate	40m/min	
B2-axis rapid feed rate	40m/min	
Y-axis rapid feed rate *2	6m/min	

■ L/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 *2

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

Type of turret head	Dodecagonal drum turret
Number of indexing positions	24
Tool size (square shank)	□25mm
Tool size (round shank)	φ32mm

*1 There are limitations on tooling.

*2 The "Milling with Y-axis" specification is standard. Optional configurations include "Without Milling" and "Milling without Y-axis."

■ Milling *2

Rotary system		Individual rotation
Milling spindle speed		6,000min^{-1} / 10,000min^{-1} (op.)
Spindle speed range		Stepless
Number of milling stations		12
Collet size		AR25
Holder type and Tool size	Straight	φ1mm- φ16mm
	Cross	φ1mm- φ16mm

■ Tailstock (op.)

Driving system	NC control servo-driven type
Travel	600mm
Rapid feed rate	24m/min
Quill taper	MT-3(Built-in center) / MT-4(Rotating center)
Ball screw diameter / Ball srew pitch	32mm / 8mm
Range of thrust force	- 3.9kN

■ Drive motor

L-spindle	15/11kW
R-spindle	11/7.5kW
Milling	5.5/3.7kW

■ General

Height	1,858.5mm
Floor space (W × D)	3,675mm×2,258.2mm
Machine weight (incl. control)	9,000kg

■ Power supply

Power supply	37.9kVA

● 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 Plus (2-PATH)

■ Controlled axes

Controlled axes : Standard / Y-axis	7 axes / 8 axes	
Simultaneously controlled axes : Standard	Upper	3 axes (X1, Z1, C1 axis)
	Lower	4 axes (X2, Z2, C2, B2 axis)
Simultaneously controlled axes : Y-axis	Upper	4 axes (X1, Z1, C1[C2], Y1 axis)
	Lower	4 axes (X2, Z2, C2[C1], B2 axis)

■ Input command

Least input increment	X, Z, Y, B : 0.001mm/0.0001inch (diameter for X-axis), C : 0.001°
Least command increment	X : 0.0005mm / Z, Y, B : 0.001mm / C : 0.001°
Max. programmable dimension	±999999.999mm / ±39370.0787inch, ±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 : 1-8000mm/min,0.01-314inch/min Z : 1-8000mm/min,0.01-314inch/min C : 1-4800° /min B : 1-8000mm/min,0.01-314inch/min feed/rev : 0.0001mm/rev-8000mm/min 0.000001inch/rev-50inch/rev
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%)

■ Operation and display

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

■ Program memory

Part program storage length / Number of registrable programs	4Mbyte Total 10240m	1000
		4000 (op.)
	8Mbyte Total 20480m (op.)	1000 (op.)
		4000 (op.)
Part program editing	delete, insert, change	
Program number search	Standard	
Sequence number search	Standard	
Address search	Standard	
Number of tool offset	99+99 / 999 (op.)	
Program storage memory	Battery backup	
Background editing	Standard	
DNC operation through memory card	Standard (not including memory card)	
Extended part program editing	Standard	

■ 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
Protona	Standard
Luck-bei II / NT Manual Guide i	Standard
Abnormal load detection function	Standard
NT WORK NAVIGATOR	Standard (not including contact bar)
Chatter Canceller	Standard
NT NURSE	Standard
NT Collision Guard	Standard

■ Machine support functions

Rigid tapping	Standard
Spindle synchronised control	Standard
C-axis synchronised control	Standard (G496 C1. rapid feed positioning)
Spindle orientation	Standard

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* This catalog was published in July 2026. Specifications, illustrations and data given herein are subject to change without notice.

Cat.No.0206E00012607N