NEW TW-30

NAKAMURA-TOME
PRECISION INDUSTRY CO.,LTD.

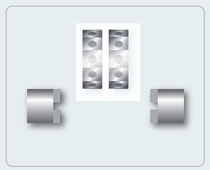
Perfect for Heavy Duty Machining.

Innovation Technology
～Creation of new values～

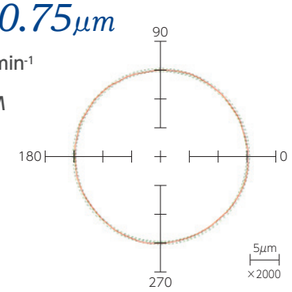
NEW TW-30

Machine rigidity, specifications and machining accuracy were all improved.
Two-spindle two-turret multitasking machine, which boosts productivity.
We propose various solutions with proven user-friendliness and ease of use.

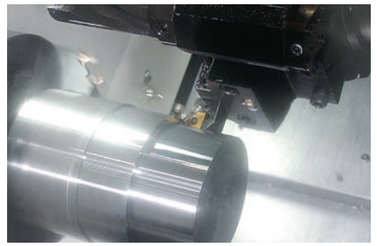
T×2 Double turret
S×2 Twin-Spindle
RZ R spindle
M×2 Double Milling Motor
C×2 C-axes



■ Roundness 0.75μm
● Speed:2,350min-1
● Material:BsBM



Turning



L,R-Spindle

■ Spindle motor	22/18.5kW
■ Cutting cross section	4.41mm²/rev
■ Depth of cut	7mm
■ Feed	0.63mm/rev
■ O-D Grooving tool width	12mm

Milling

Milling(op.)

■ Spindle motor	7.5/3.7kW
■ Speed	6,000min-1
■ Y-axis travel	±70mm
■ Metal Removal Rate	56.32cc/min
■ Tool diameter (Solid end mill)	ϕ20mm
■ Depth of cut	11mm
■ Feed	0.535mm/rev

Reliable performance and stress-free workability

■ Bar capacity ϕ71mm

Left and right spindle motors	22/18.5kW 3,500min-1

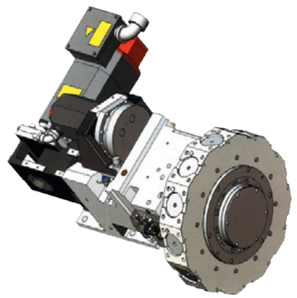
Faster feed

X-axis feed	2.08times faster
Z-axis feed	1.67times faster
X-axis travel	265.5mm
Rapid feed	25m/min
Z-axis travel	350mm(Only L-side)
Rapid feed	30m/min

Improved Milling capabilities

Belt-driven

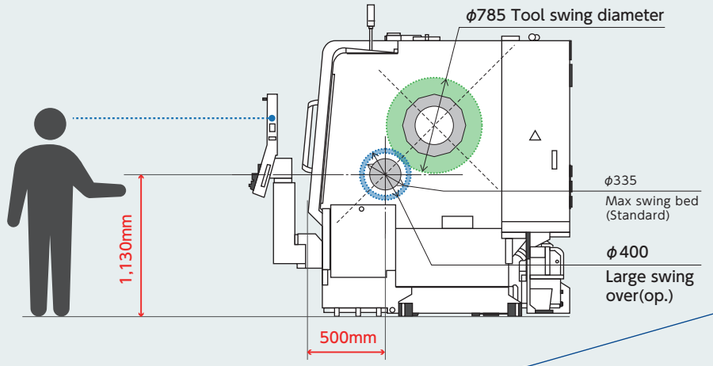
Eliminate thermal growth and vibrations. Faster milling speed.



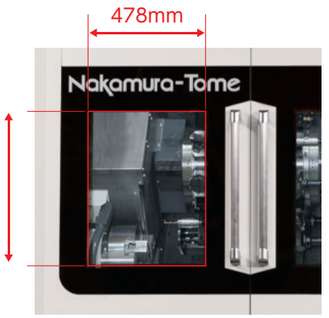
Milling Motor 7.5/3.7kW
6,000min-1

Stress-free

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



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



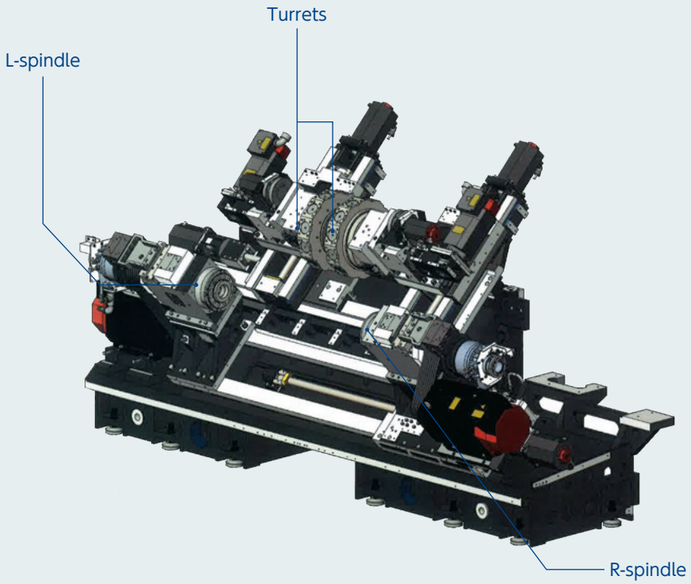
Visibility

Large window, which is 2.5 times larger compared to the previous model

NT SmartX

Maintenance performance

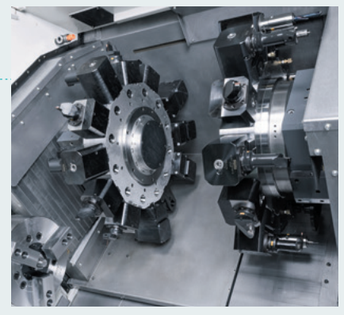
Machine cover design was improved, so that the coolant tank can be easily pulled out from the machine front



24stations

Dodecagonal drum turret / 12st ×2

- ▶Type of tool stations:Dodecagonal 12 station turret
- ▶Number of tools : 12
- ▶Number of indexing positions:12
- ▶Number of driven-tool stations:12
- ▶Driven-tool spindle speed:6,000min-1
- ▶Tool size (square shank/ round shank): □25mm/ϕ32, ϕ40, ϕ50mm
- ▶Milling tool size:ϕ2 ～ϕ20mm



Eco-friendly

Inverter controlled hydraulic unit reduced power consumption.
Furthermore,Lubricant oil recovery rate is improved.

Inverter type hydraulic unit

Power consumption reduction ※1 21%

※1 This value may change depending on actual machining conditions.

Lubrication oil collection rate ※2 70%

※2 Without Y-axis:Theoretical values

NT Smart X

Full Operator Support from
Ease of Use to Reliability.

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

Cut in check

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

Main features of NT SmartX

Standard

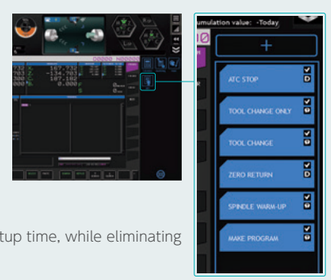
- NT Work Navigator
- Airbag (Overload detection)
- NT Nurse function
- Status Display Function
- Setup Display
- Trouble Guidance
- Productivity Function
- Warm up Function
- Tool spindle loading Operation function
- Parts Catcher G Operation Function
- NT Machine Simulation
- NT Collision Guard
- NT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

Digital Chuck Interlock

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

One Touch MDI

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



Reduce programming and setup time, while eliminating input errors.

NT Smart Sign

Nakamura-Tome IoT software

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

■ Monitoring

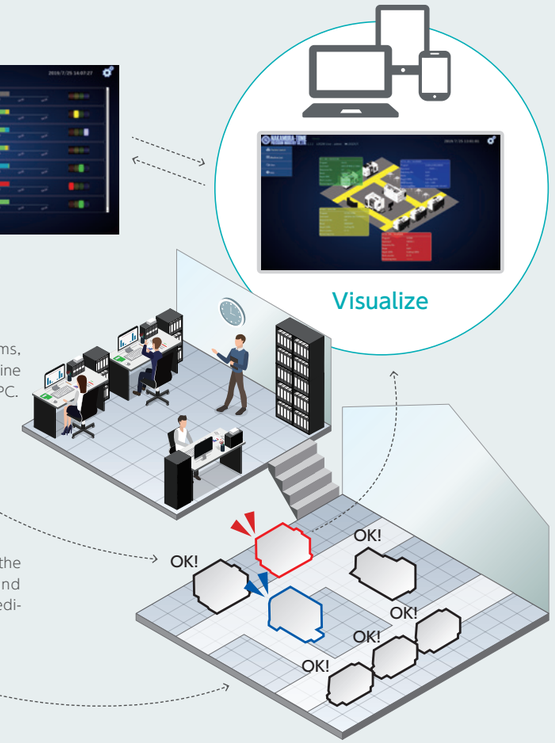
Real Time Monitoring of machine running conditions, in addition to visualizing alarm history and past events.

■ 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 Navi AI

Feedback

Compensation model built using AI machine learning.

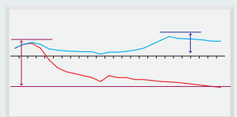
Standard for NT Smart X

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

Double safety features for maximum protection

NT Machine Simulation / NT Collision Guard + Airbag

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

NT Machine Simulation

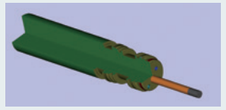
NT Machine Simulation is for Virtual Collision Checking of NC Programs without axis movement.

Image shown here is of a 2-turret machine

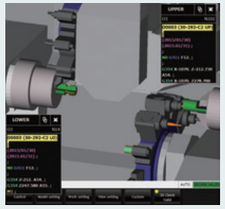
By checking in advance the chuck and the tool, the tool and the cover, etc. and checking the machining process etc., the risk of a machine collision when actually moving the machine can be reduced.

It can simulate while checking the remaining movement amount and modal information

It can override the settings for fast feed and cutting feed individually.
Simulation by process, single feed is possible.



During part simulation, several display screens are available, such as tool view, turret view or machine view.



It can show or hide the machining program.
In addition, the display of the program is color-coded for each word, and this color scheme can be set arbitrarily from the option setting screen.

NT Collision Guard

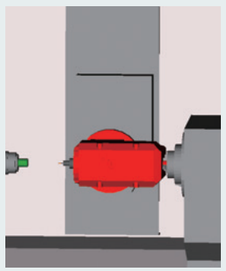
Preventive safety technology - Machine collisions are avoidable!

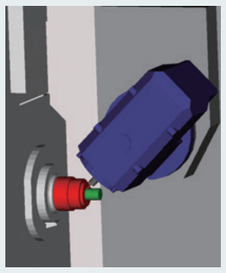
Image shown here is of a Tool spindle machine

Available in automatic mode or in manual mode.
Using registered 3D models of machine, chucks, tools, holders and parts, machine collisions can be monitored and prevented in real time during automatic, manual or jog movements.
Even turret indexing is monitored to prevent collisions, drastically reducing collision risks, especially during machine setup.

Tool 3D Model setup was simplified.

After turret rotation, the tool being indexed is read from the program, and the corresponding tool 3D model is automatically displayed, or can be changed from a pre-registered tool 3D Model list if necessary.





Airbag (Overload detection)

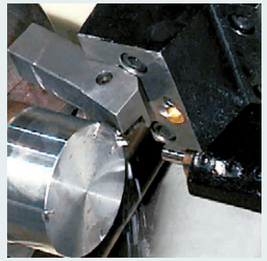
Compared to other machines, Nakamura-Tome machine will not break after the slightest collision. The "Airbag Function" minimizes the damage that may occur during a collision.

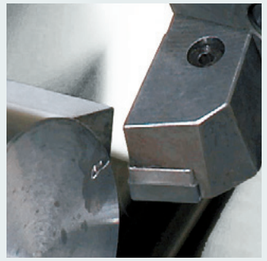
If a machine collision occurs,
there is good reason to be assured: Airbag !

Barrier?
Even with barrier function, machine collisions may occur

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

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





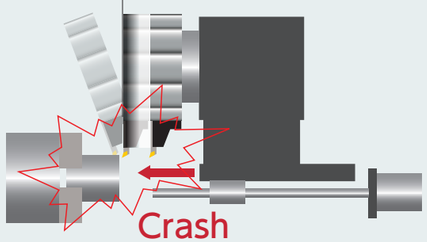
Without Airbag

Machine will not be stop immediately.
The slide continues to move even after collision.

With Airbag

Retraction within 0.001 sec

Crash !
Within 1 milliseconds after the crash, servo motor-feeding direction is reversed and the machine stops in EMG mode.



▲Video

* This feature does not mean zero impact

NT Work Navigator

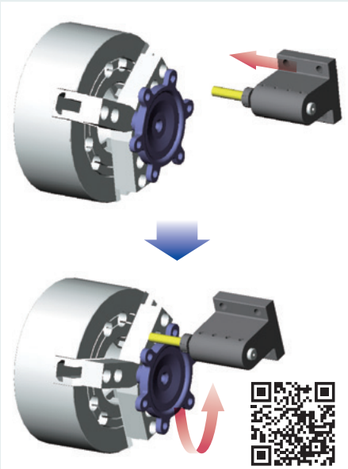
X Y Z B C

Advanced NT Work Navigator !

A new upgrade makes it possible to navigate with the X and Y-axes. Many parts with irregular outer surfaces, requiring coordinate recognition with X or Y-Axis, become within the range of NT Work Navigator.

No fi xtures required

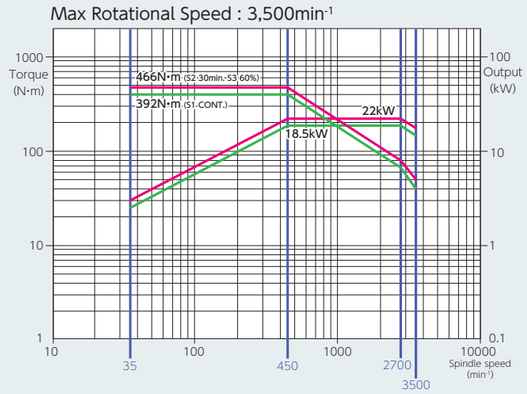
Machining parts with non-round shapes, such as forgings or castings requires that the raw part coordinates be recognized by the CNC control.
In order to achieve this without requiring extra cost or additional options, the NT Navigator is used.
It works just by touching the part with a simple inexpensive probe (mostly 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 Navigator is a cost cutting feature in multitasking machines, eliminating the need for positioning fixtures and special clamping devices.



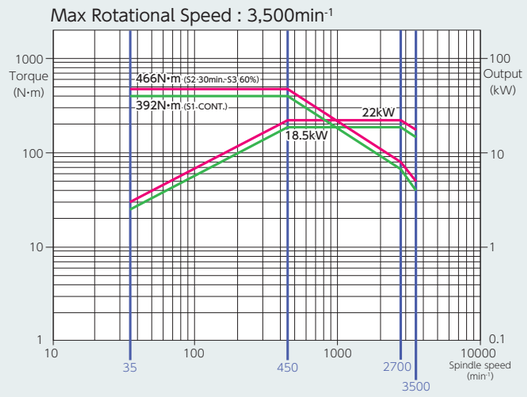
▲Video

Torque/Output Chart

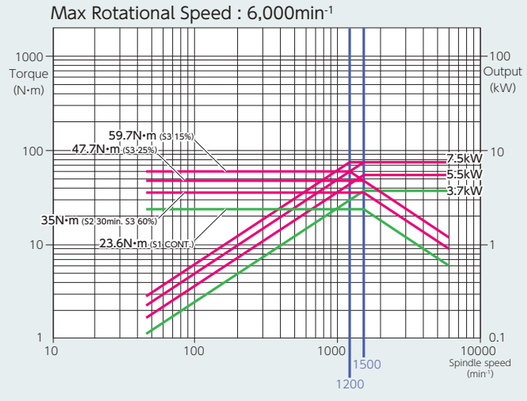
L-spindle motor
Standard
Bar capacity ϕ71mm



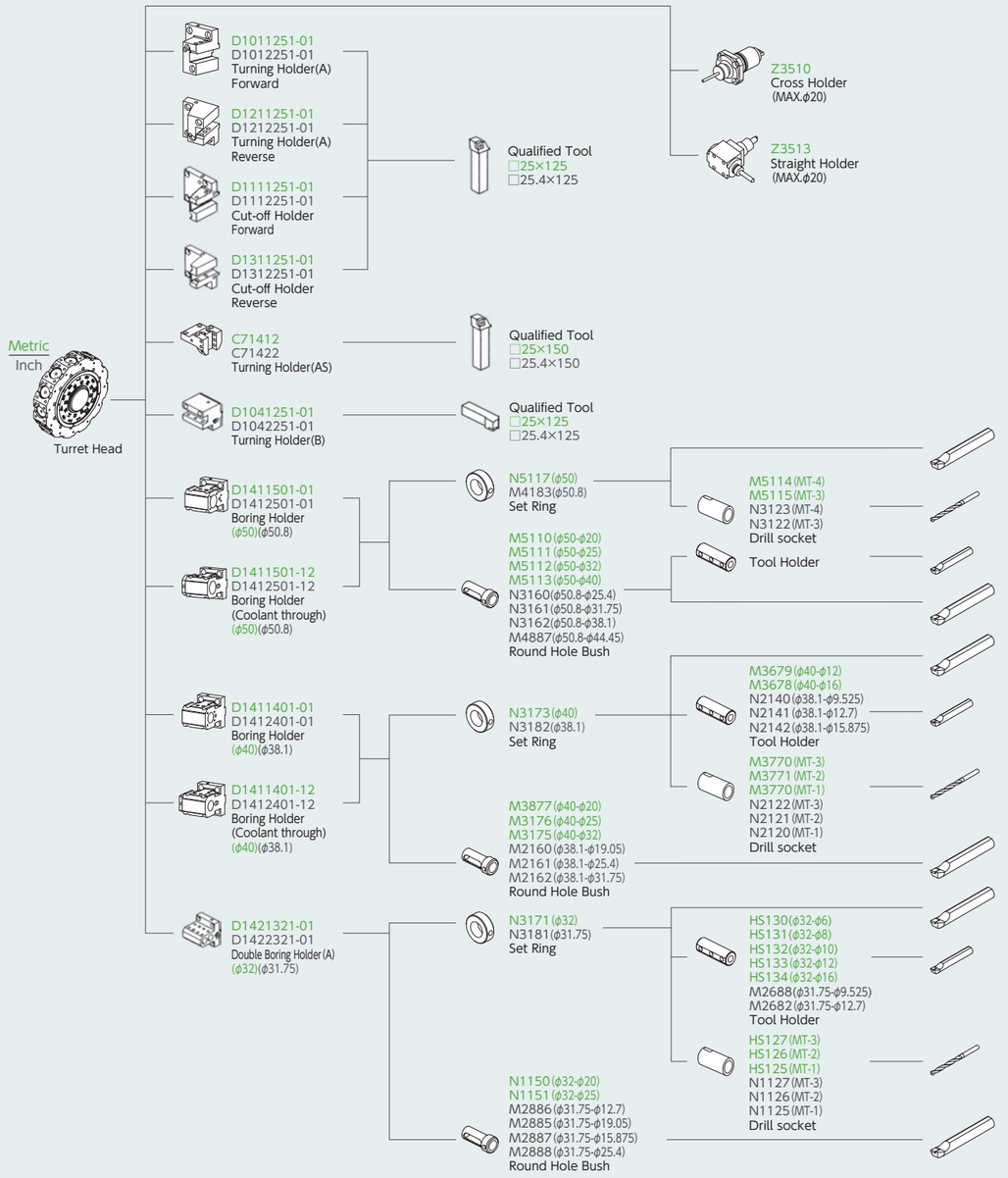
R-spindle motor
Standard
Bar capacity ϕ71mm



Milling motor
Standard

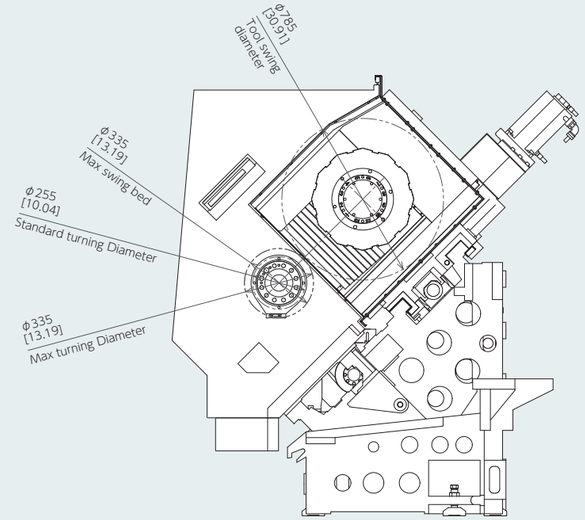


Tooling System



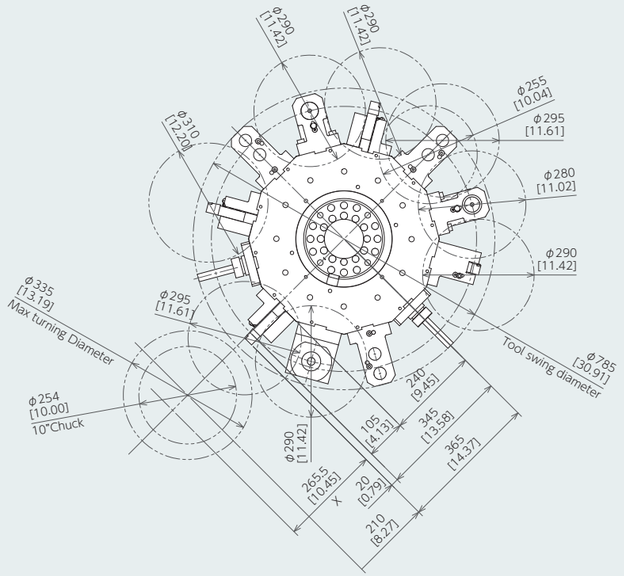
Maximum Tool Diameter／Tool Interference／Travel Range／Floor Space

Maximum Tool Diameter



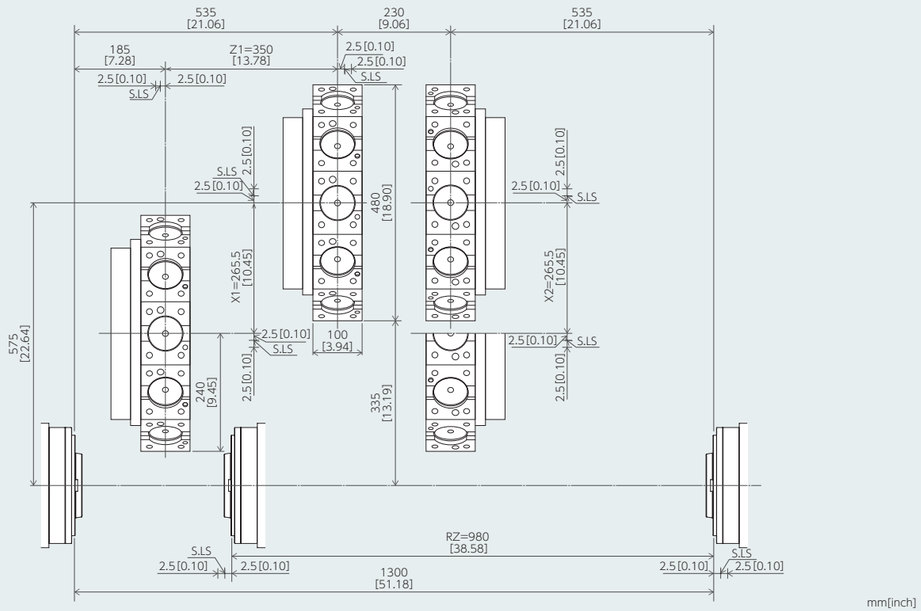
mm[inch]

Tool Interference



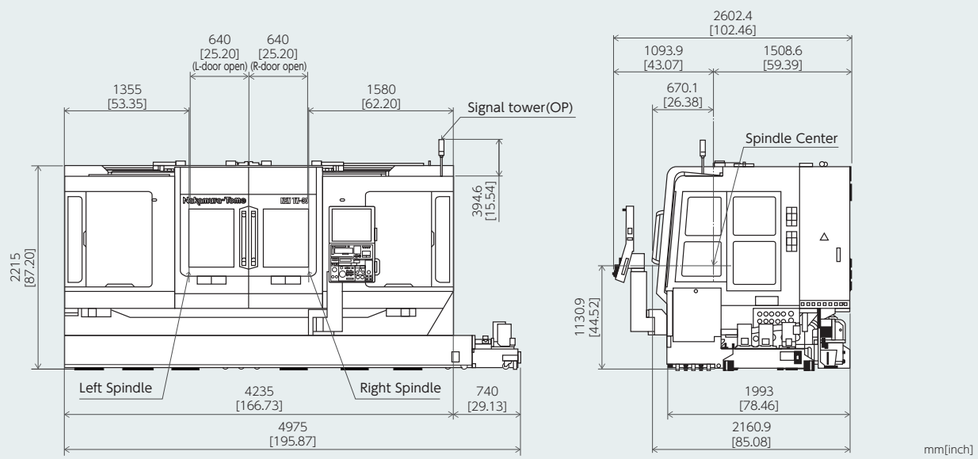
mm[inch]

Travel Range



mm[inch]

Floor Space



mm[inch]

■ Capacity

Max. turning diameter (standard/large swing spec.)	ϕ335mm / ϕ400mm(op.)
Distance between spindles	max.1,300mm
Max. turning length	300mm
Bar capacity	ϕ71mm
Chuck size	10"

■ Axis travel

Slide travel X1	265.5mm
Slide travel X2	265.5mm
Slide travel X3	350mm
Slide travel RZ	980mm

■ Left spindle

Spindle speed	3,500min^{-1}
Spindle speed range	Stepless
Spindle nose	A2-8
Hole through spindle	85mm
I.D. of front bearing	120mm
Hole through draw tube	72mm

■ Right spindle

Spindle speed	3,500min^{-1}
Spindle speed range	Stepless
Spindle nose	A2-8
Hole through spindle	85mm
I.D. of front bearing	120mm
Hole through draw tube	72mm

■ Left turret

Type of tyrret head	Dodecagonal drum turret
Number of tool stations	12
Number of indexing positions	12
Tool size(square shank)	□25mm
Tool size (round shank)	ϕ32, ϕ40, ϕ50mm

■ Right turret

Type of turret head	Dodecagonal drum turret
Number of tool stations	12
Number of indexing position	12
Tool size(square shank)	□25mm
Tool size (round shank)	ϕ32, ϕ40, ϕ50mm

■ Rotating Tools (Left and Right turrets /op.)

Rotary system	Individual rotation	
Driven-tool spindle speed	6,000min^{-1}	
Spindle speed range	Stepless	
Number of driven-tool station	12×2	
Tool shank	Straight holder	ϕ2mm～ϕ20mm
	Cross Holder	ϕ2mm～ϕ20mm

■ Drive motor

L - spindle	22/18.5kW
R - spindle	22/18.5kW
Driven tools	7.5/3.7kW

■ General

Height	2,250mm
Floor space (L x W)	4,370mm ×2,125mm
Machine weight (incl. control)	14,500kg

■ Power requirements

Power supply	61.5kVA (65.4kVA)

●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.)

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

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

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

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

■ Items

Control Type	FANUC 32i-B (2-PATH)

■ Controlled axes

Controlled axes	4 axes
Simultaneously controlled axes	Left turret : 2 axes (X1, Z1axis) 2 axes (X2, RZ axis)

■ Input command

Least input increment	0.001mm/0.0001inch (diameter for X-axis)
Least command increment	X : 0.0005mm / Z : 0.001mm
Max. programmable dimension	±999999.999mm / ±39370.0787inch
Absolute/ incremental programming	X, Z / U, W,
Decimal input	Standard
Inch/ Metric conversion	G20 / G21
Programmable date input	G10

■ Feed function

Cutting feed	Feed mm/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) 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. It is also on with G316 command. The values in parentheses are normal value.
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 accelaration/ deceleration	Standard
Linear accel./decel. After cutting feed interpolation	Standard
Rapid feed override	F0/25/50/100% (changeable to every 10% by NT Setting screen)
Cutting feedrate override	0 ～ 150% (each 10%)
AI Contouring control Ⅰ	G5.1
L-Spindle override	50%～ 120% Set every 10%
R-Spindle override	50%～ 120% Set every 10%

■ Program memory

Part program storage length	256Kbyte Total 640m (Left/Right : Each 320m) 512Kbyte Total 1280m(op.) 1Mbyte Total 2560m(op.) 2Mbyte Total 5120m(op.) 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	Total 500 programs (Left/Right : Each 250 programs) Total 1000 programs : Part program storage length 512KB/1MB/2MB/4MB/8MB(op.) Total 2000 programs : Part program storage length 1MB(op.) Total 4000 programs : Part program storage length 2MB/4MB/8MB(op.)
Program storage memory	Backed up by battery
Multiple program simultaneous editing	Standard
DNC operation through memory card	Standard (not including memory card)
Extended part program editing	Standard

■ Operation and display

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

■ Programming assist function

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

■ NT Work Navigator

NT NURSE	Standard
Spindle sychronised control	Standard
Spindle orientation	Standard

■ ECO function

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

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