WT-300

NAKAMURA-TOME
PRECISION INDUSTRY CO.,LTD.

High Precision Two-spindle Two-turret Multitasking Machine

Solve factory problems with this machine

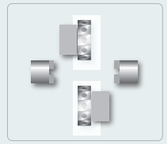
Innovative Technology
～Creating new values～

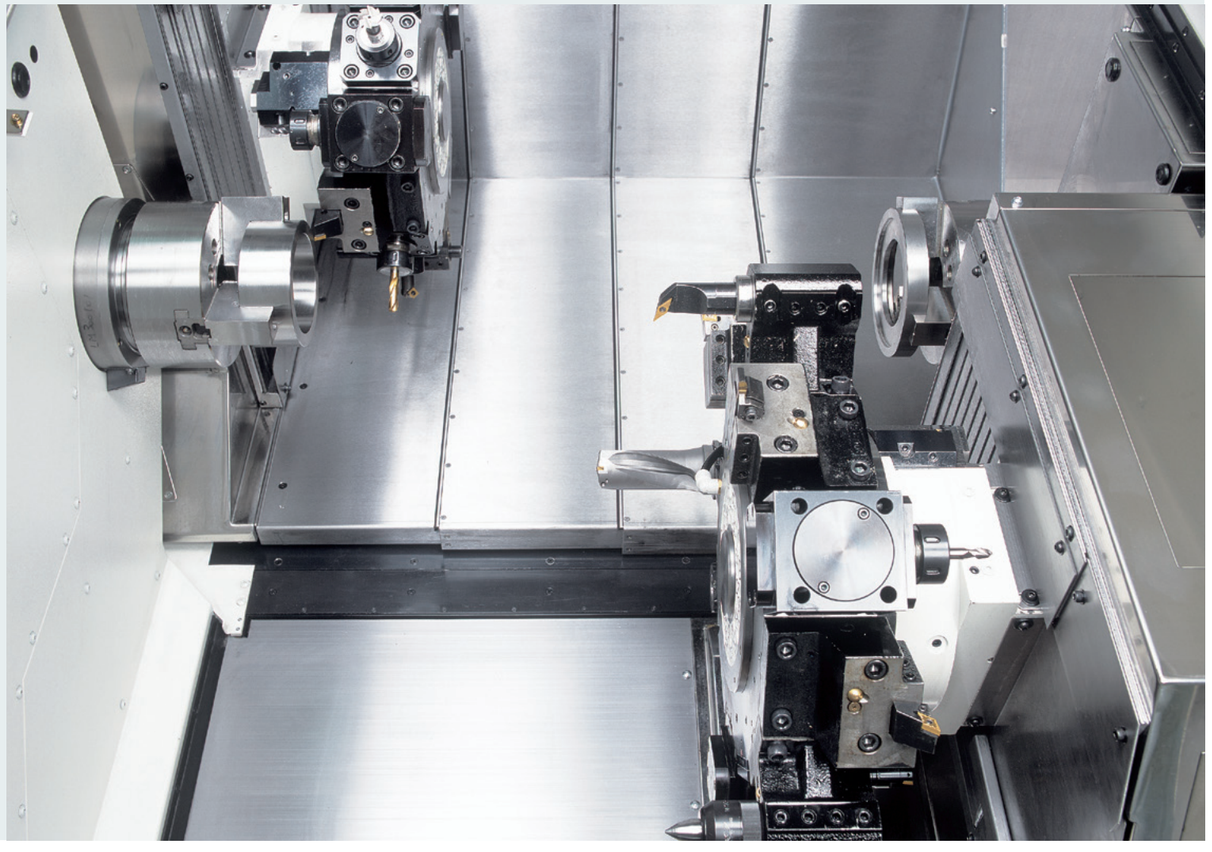
WT-300

High-rigidity multitasking machine equipped with upper and lower turrets and twin opposed spindles. It is a machine equipped with box-way slides for all axes, offering high stability and making it ideal for machining difficult-to-cut and high-hardness materials.
A wide variety of options, peripheral devices, and a full range of software are available to meet a wide variety of needs.

- The Y-axis on the upper turret is available as an option.
- 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.
- All axes with box-way slides.

S×2 Twin-Spindle
T×2 Double turrets
B2 R-spindle
C×2 C-axes
M×2 Milling Motor
Y Y-axis





Machining Capabilities

One Machine for All Types of Machining

The WT-300 highly rigid multitasking machine has upper and lower turrets and twin opposed spindles that can perform a variety of machining operations depending on the tool to be set. In addition to turning, milling, gearing, and grooving, this machine can also be used for applications that require high rigidity, such as Y-axis parting off. It also has a maximum bar capacity (hole through spindle) of ϕ102mm, allowing machining of all workpiece sizes, from small to large diameters, to be integrated into this ONE machine: The highly rigid and flexible Nakamura-Tome standard machine.

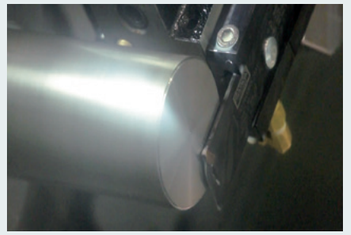
Product	Helical gear
Category	Automotive
Time	2 min. 30 sec.
Material	SCr415
Blank material dimensions	ϕ72mm bar

Gear Skiving

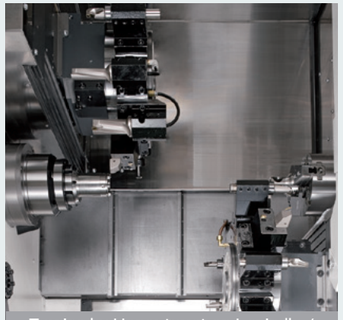
- Material *SUS303*
- Module *1.25*

	I.D. Gear	O.D. Gear
Cutter speed	*1,200min⁻¹*	*1,200min⁻¹*
Spindle speed	*600min⁻¹*	*533min⁻¹*
Feed	*0.1mm/rev*	*0.1mm/rev*
Number of teeth	*40*	*45*
Tip diameter	*ϕ47.8mm*	*ϕ58.45mm*
Time	*2 min 30 sec.*	*2 min 46 sec.*

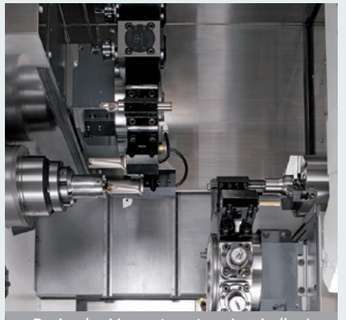
Y-axis Parting off



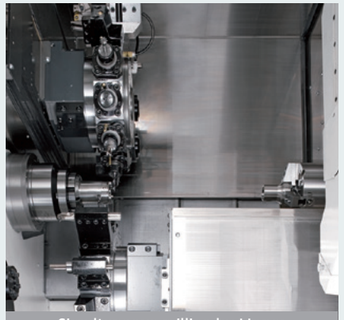
- Cutting speed *200mm/min*
- Feed *0.3mm/rev*
- Insert width *3mm*
- Material *S45C ϕ63mm*
- Time *6.8sec.* (*Non-step*)



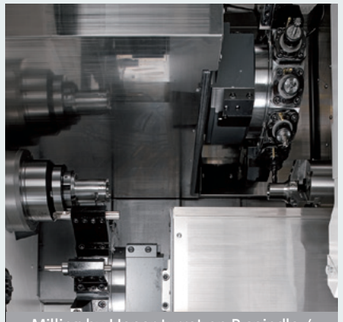
Turning by Upper turret on L-spindle / Lower turret on R-spindle



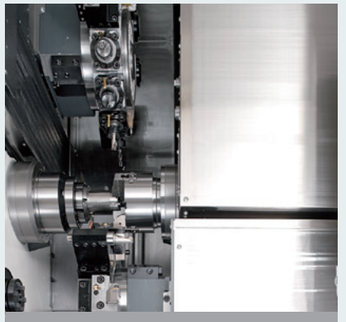
Boring by Upper turret on L-spindle / Lower turret on R-spindle



Simultaneous milling by Upper and Lower turret on L-spindle



Milling by Upper turret on R-spindle / Lower turret on L-spindle

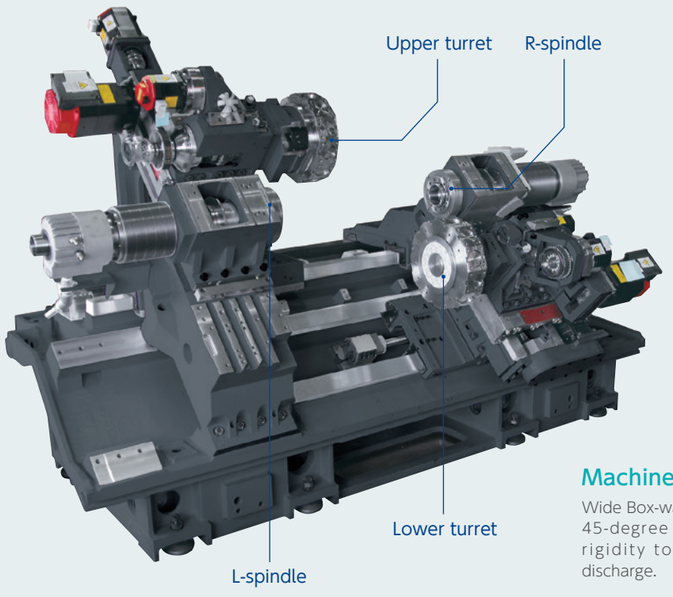


Transfer

Simultaneous milling by Upper and Lower turret on R-spindle

All Axes with Box-way Slides Enable Highly Rigid and Stable Machining.

Equipped with Box-way slides on all axes which are traditionally hand scraped by highly skilled technicians, according to our stringent quality control standards.



■R-spindle

Bar capacity $\phi 65mm$

Standard	Option
Spindle motor $15/11kW$ $4{,}500min^{-1}$	Spindle motor $18.5/15kW$ $4{,}500min^{-1}$

Bar capacity $\phi 102mm$

Option	Option
Spindle motor $15/11kW$ $2{,}500min^{-1}$	Spindle motor $18.5/15kW$ $2{,}500min^{-1}$

Machine Bed

Wide Box-way slides on X, Z and Y-axes.
45-degree slant bed structure with high rigidity torque tube and smooth chip discharge.

■L-spindle

Bar capacity $\phi 65mm$

Standard	Option	Option
Spindle motor $15/11kW$ $4{,}500min^{-1}$	Spindle motor $18.5/15kW$ $4{,}500min^{-1}$	Spindle motor $22/18.5kW$ $4{,}500min^{-1}$

Bar capacity $\phi 71mm$

Option	Option	Option
Spindle motor $15/11kW$ $4{,}000min^{-1}$	Spindle motor $18.5/15kW$ $4{,}000min^{-1}$	Spindle motor $22/18.5kW$ $4{,}000min^{-1}$

Bar capacity $\phi 80mm$

Option	Option	Option
Spindle motor $15/11kW$ $3{,}500min^{-1}$	Spindle motor $18.5/15kW$ $3{,}500min^{-1}$	Spindle motor $22/18.5kW$ $3{,}500min^{-1}$

Bar capacity $\phi 102mm$

Option	Option	Option
Spindle motor $15/11kW$ $2{,}500min^{-1}$	Spindle motor $18.5/15kW$ $2{,}500min^{-1}$	Spindle motor $22/18.5kW$ $2{,}500min^{-1}$

■Upper turret

Standard	
Type of turret head	$Dodecagonal$
Number of milling stations / Number of indexing positions	$12/24$

Option	
Milling motor	$5.5/3.7kW$ $3{,}600min^{-1}$

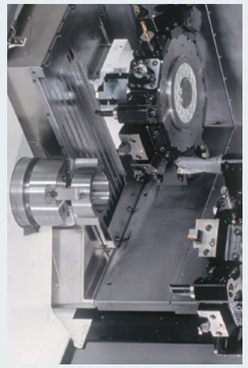
Option	
Y-axis slide travel	$\pm 60mm$ $(L{:}\phi 65,\phi 71)$ $\pm 40mm$ $(L{:}\phi 80,\phi 102)$

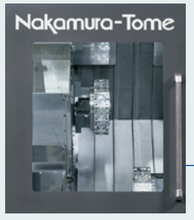
■Lower turret

Standard	
Type of turret head	$Dodecagonal$
Number of milling stations / Number of indexing positions	$12/24$

Option	
Milling motor	$5.5/3.7kW$ $3{,}600min^{-1}$

The Upper and Lower turrets reduce cycle time.





Large window for easy viewing of the machining area

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

NT SmartX 19 inch touch screen

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

Parts catcher type G(op.)

Tool setter(op.)

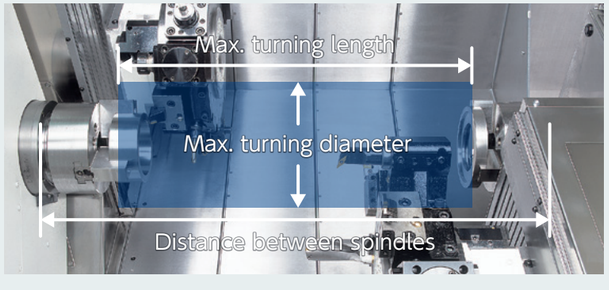
Can be configured for a detachable, or for an automatic swing-down type tool setter.

■Max. turning length $780mm$

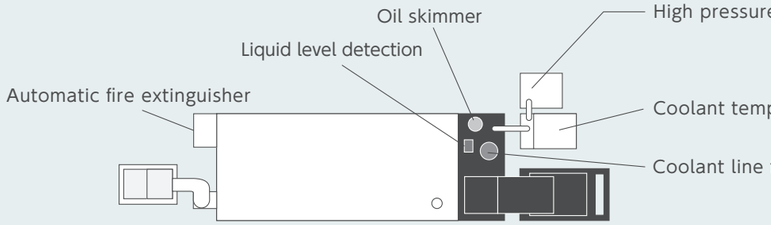
■Max. turning diameter $\phi 270mm$
*L-spindle:$\phi 65$, $\phi 71$ specifications

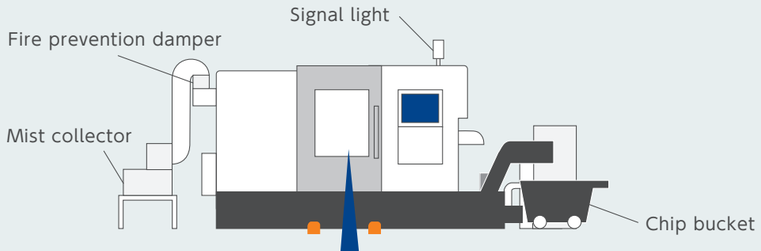
■Bar capacity $\phi 65mm$
$(op.\ \phi 71,\ \phi 80,\ \phi 102mm)$

■Distance between spindles $Max.1{,}100mm$ $Min.250mm$

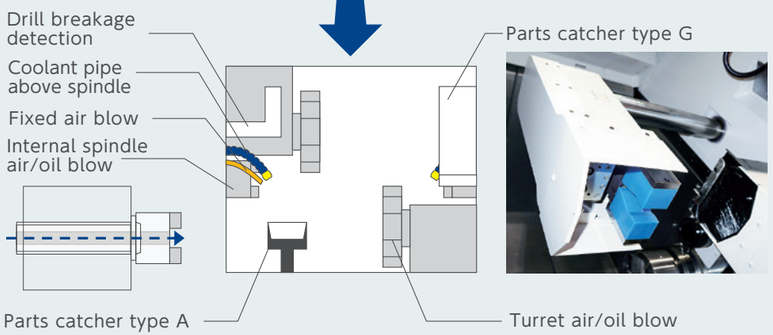


Various Options to Meet our Customer's Needs.





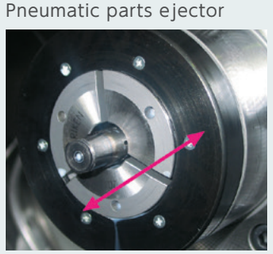
Chip conveyor (Side/Rear)



Parts catcher type G

Tool setter

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

【GR-210 High-Speed】【GR-210 NEW】

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

Parts catcher type G Option

Bar capacity			ϕ65	ϕ71	ϕ80	ϕ102
Method			Gripper			
Part size	Diameter	mm	ϕ65	ϕ71	ϕ80	ϕ100
	Length	mm	150			
	Weight	kg	3.0		5.0	
Unloading time		s	6.0			
Ejecting method			Belt conveyor & Chute			

Parts catcher type A Option

Bar capacity			ϕ65	ϕ71	ϕ80	ϕ102
Method			Swing-in Bucket			
Part size	Diameter	mm	ϕ65	ϕ71	ϕ80	ϕ100
	Length	mm	150			
	Weight	kg	3.0			
Unloading time		s	5.0			
Ejecting method			Chute			

NT SmartX

Full Operator Support from Ease of Use to Reliability

Main features of NT SmartX

Standard

- NT WORK NAVIGATOR
- Airbag (Overload detection)
- NT NURSE
- Status Display Function
- Setup Display
- Trouble Guidance
- Productivity Function
- Warm up Function
- Smart Support
- Drop Converter
- Cut in check
- Program Optimizer
- NT Machine Simulation
- NT Collision Guard
- NT Thermo Navigator AI
- Digital Chuck Interlock
- NT Manual Guide i
- One touch MDI
- 3D Smart Pro AI

19 inch color LCD touch panel	Voice Guidance
QWERTY keyboard	Multi-Touch Screen
Original Menu screen	Touch pad

Cut in check

Nakamura-Tome AI

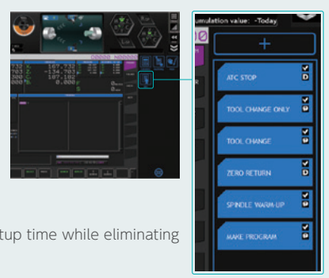
■ Powered by AI as standard equipment

- NT Thermo Navigator AI
- 3D Smart Pro AI

Digital Chuck Interlock

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

One Touch MDI



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

Reduce programming and setup time while eliminating input errors.

NT Smart Sign

Nakamura-Tome IoT software

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

■ Monitoring

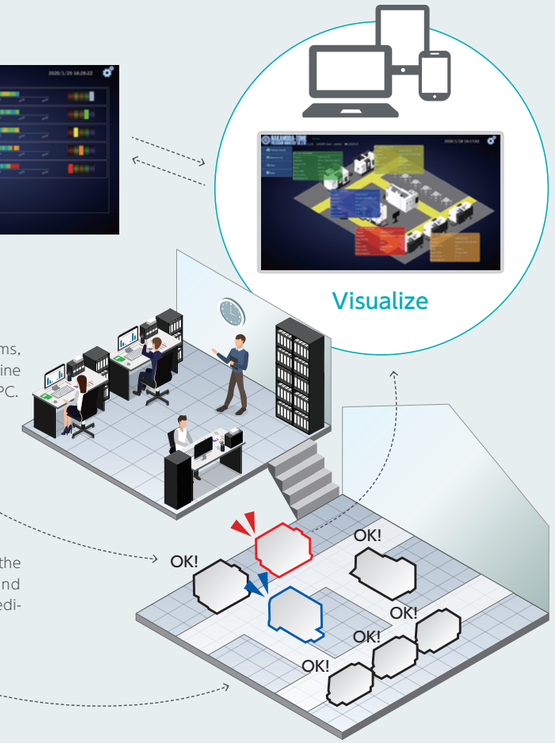
Real-Time Monitoring of machine running conditions, in addition to visualizing alarm history and past events.

■ 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.

① Time
② Measured Dimensions
③ Retrieval of Wear Offset Data

Acquired Data analyzed with NT Thermo Navigator AI

Feedback

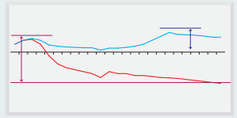
Standard for NT Smart X

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.

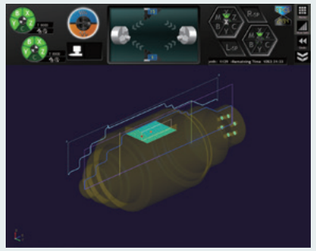


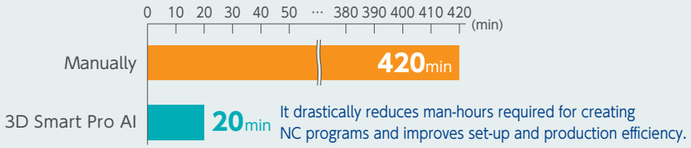
— Pre-correction thermal displacement data
— Thermal displacement data after correction

3D Smart Pro AI

AI analysis NC programming support function

From the 3D CAD drawing, AI automatically analyzes “model geometry”, “machining path”, “machining tools”, “machining conditions”, and “machining process sequence”, to create NC programs for all processes from raw material to finished product.





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

3 useful features available with 3D Smart Pro AI

1. Transfer setting

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

2. Optimization of machining processes

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

3. Tolerance setting

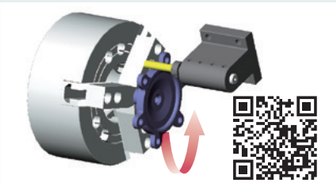
Once the tolerance value is input, the target value for machining can be set.

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

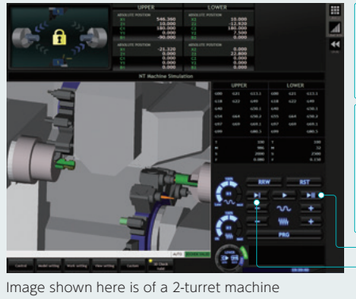
NT Machine Simulation / NT Collision Guard + Airbag (Overload detection)

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!

By checking in advance for interference between chucks and tools, or between tools and covers, etc, in addition to checking the machining processes, the risk of a machine collision is drastically reduced, and the machining processes can be optimized.



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

Available in automatic or manual mode. Using the built-in 3D models on the 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.

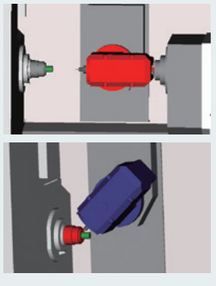


Image shown here is of a Tool spindle machine

Airbag (Overload detection)

Compared to other machines, Nakamura-Tome machines 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 confident: Airbag !

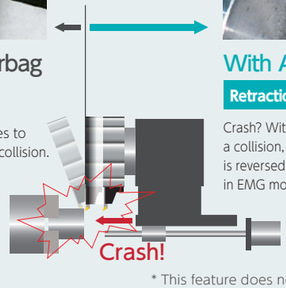
When the machine collides, there is no reason to panic.

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

Barrier?
Even with barrier function, machine collisions may occur

Without Airbag

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



With Airbag

Retraction within 0.001 sec

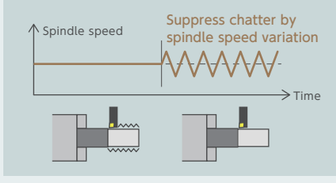
Crash? Within one millisecond after a collision, the servo motor direction is reversed, and the machine stops in EMG mode.

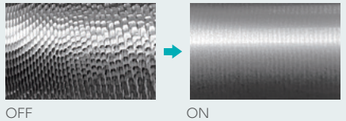
▲Video

* This feature does not mean zero impact

Chatter Canceller

Reduce the chatter and vibration by automatically changing the spindle speed up/down continuously during cutting.
The function can be easi ly turned on with the M-code, and the amplitude and frequency can be set arbitrarily.



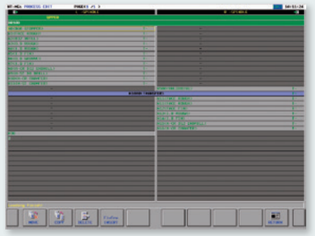


OFF ON

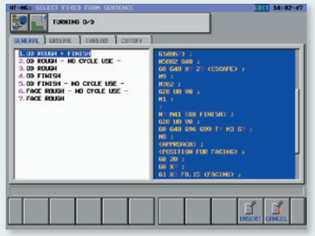
* It does not guarantee that the function works without chatter and vibration.
* Chatter and vibration reduction depend on the setup and the cutting condition.

NT Manual Guide i (LUCK-BEI II)

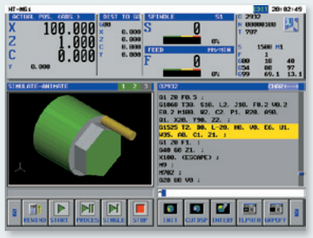
A programming guidance system with the ability to generate NC programs (ISO/EIA G-code programs) easily. Processes created in conversational mode can be cut, copied or pasted ensuring flexibility. Additionally, several cycles such as part-transfer cycle, requiring waiting M-codes, are readily made with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

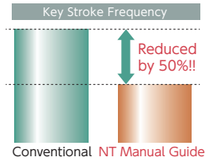


▲Fixed-form sentence function
NT Manual Guide i contains more than 300 types of fixed form sentences. Operator can select these fixed form sentences for the program from a menu screen.



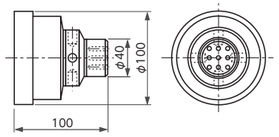
▲Simulation
Accurate simulation of turning and milling operations using a 3D solid model.

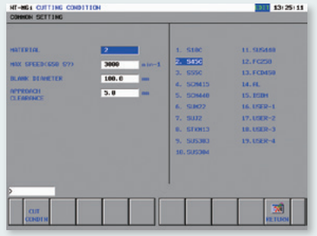
By introducing the “automatic cutting condition setting function”, the number of key strokes required to make a program were reduced by 50% reduced, compared with the previous NT-Manual guide version.



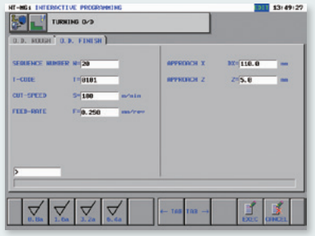
Automatic Cutting-Condition Setting Function

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

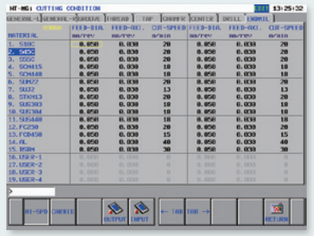




By selecting the material, cutting conditions B are automatically input.

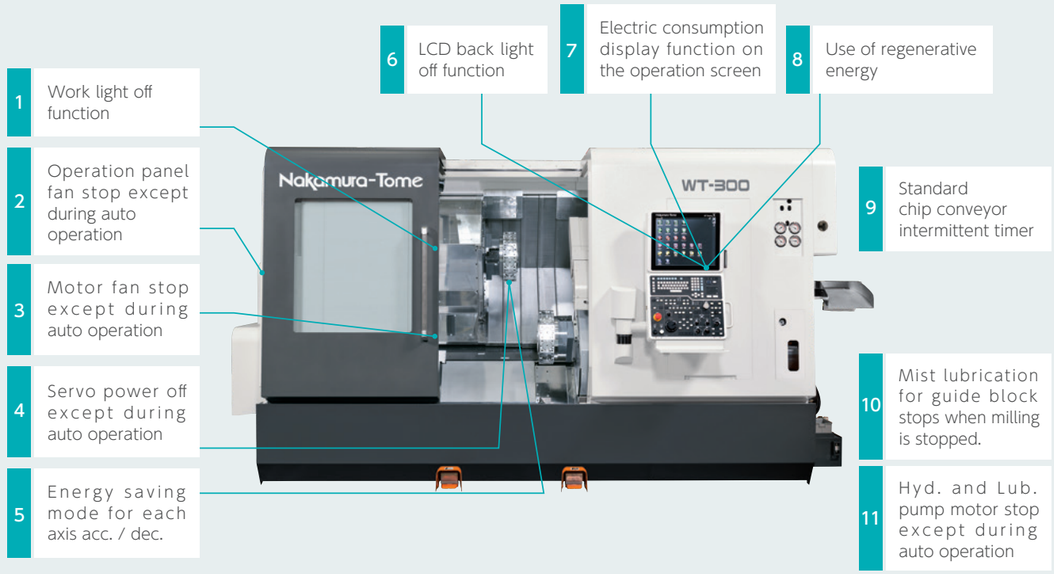


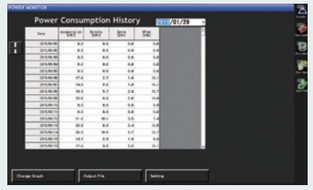
By setting the surface roughness, machining conditions are automatically input



Cutting conditions. End mill

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

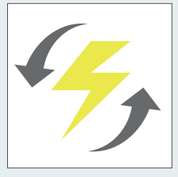




Power consumption monitoring screen

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.

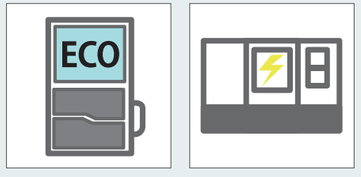
Use of regenerative energy



Amount of electricity recovered approx. 13.7%

* For WY-100Ⅱ

Addition of ECO mode function to NT SmartX Improvement of power control system



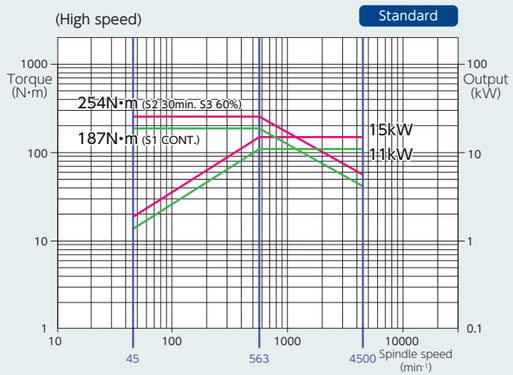
Cut down power consumption by approx. 72%

* When ECO mode is enabled

Torque/Output Chart

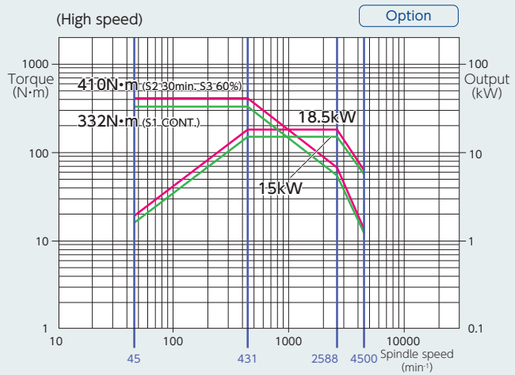
L/R spindle motor

Motor Output 15/11kW

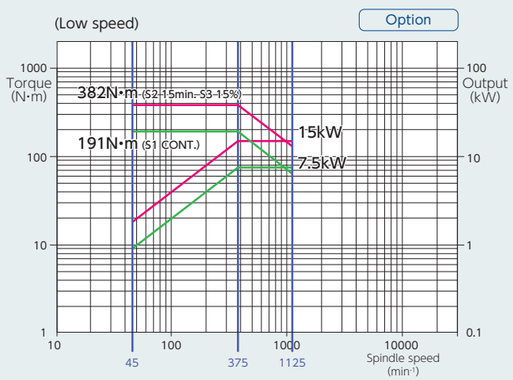


*1 *2

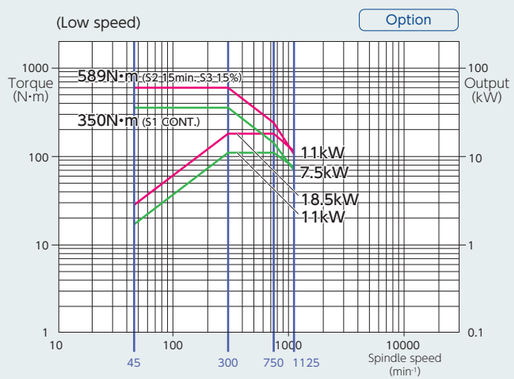
Motor Output 18.5/15kW



*1 *2



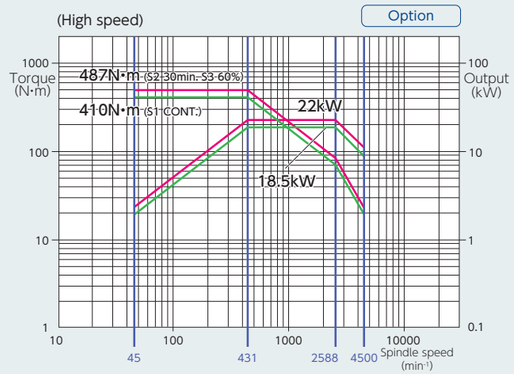
*1



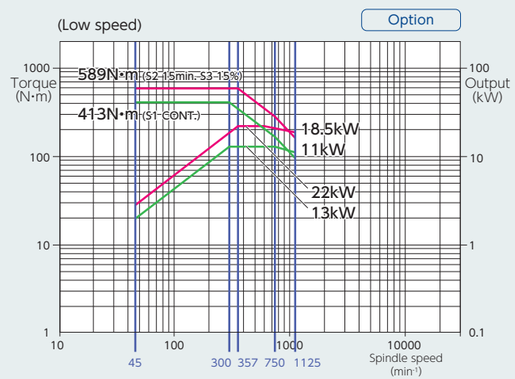
*1

L-spindle motor

Motor Output 22/18.5kW



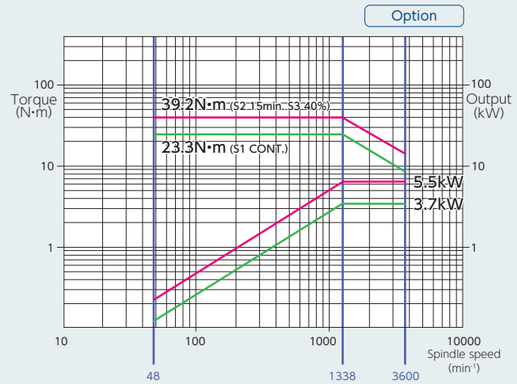
*1 *2



*1

Milling motor

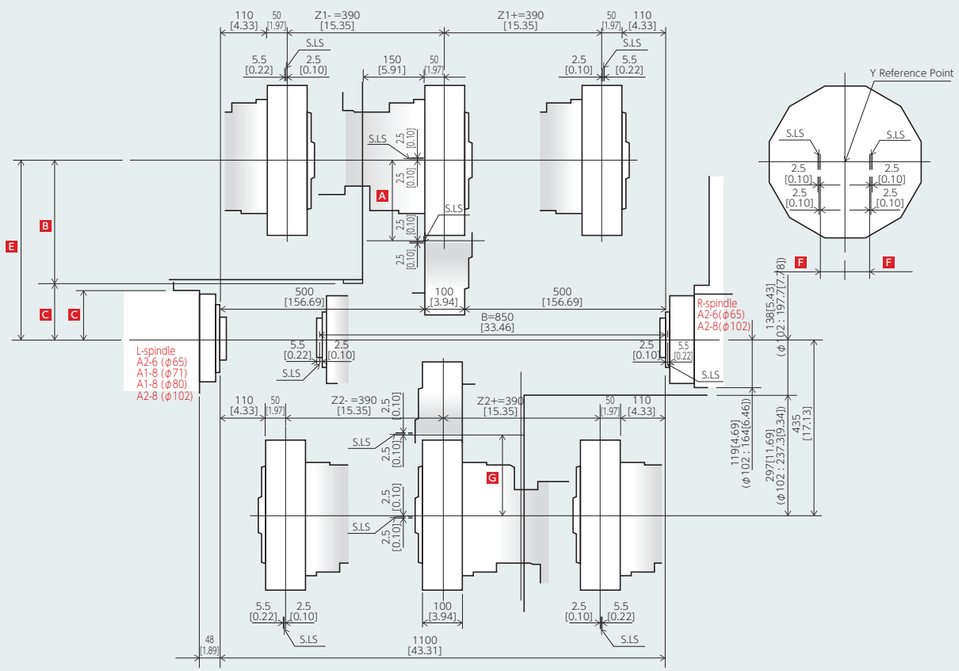
Motor Output 5.5/3.7kW



*1 Φ65 : 45min-1
Φ71 : 40min-1
Φ80 : 35min-1
Φ102: 25min-1

*2 Φ65 : 4,500min-1
Φ71 : 4,000min-1
Φ80 : 3,500min-1
Φ102: 2,500min-1

Travel Range



A X1=195[7.68] (ϕ65)
X1=188[7.40] (ϕ71)
X1=152.5[6.00] (ϕ80, ϕ102)

B 304.3[11.98] (ϕ65)
297.3[11.70] (ϕ71)
255.3[10.05] (ϕ80, ϕ102)

C 130.7[5.15] (ϕ65)
137.7[5.42] (ϕ71)
164.7[6.48] (ϕ80, ϕ102)

D 119[4.69] (ϕ65)
126[4.96] (ϕ71)
146.5[5.77] (ϕ80, ϕ102)

E 435[17.13] (ϕ65, ϕ71)
420[16.54] (ϕ80, ϕ102)

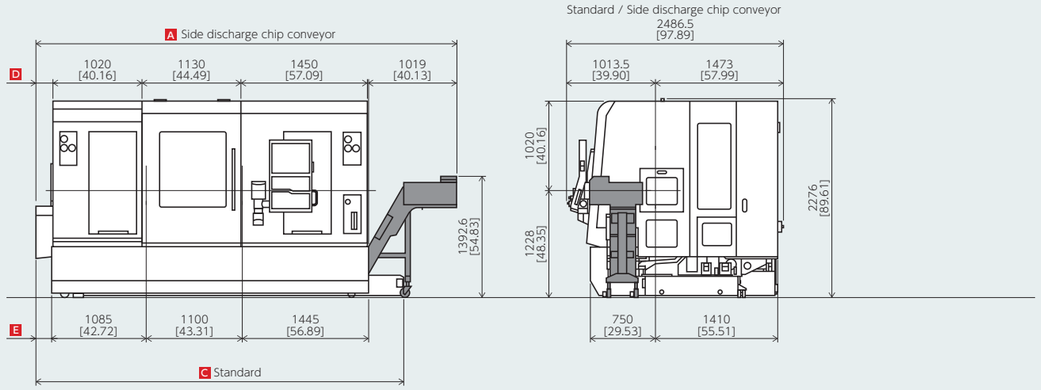
F Y=60[2.36] (ϕ65, ϕ71)
Y=40[1.57] (ϕ80, ϕ102)

G X2=195[7.68] (ϕ65, ϕ71, ϕ80, L:ϕ102)
X2=135[5.31] (L,R:ϕ102)

mm[inch]

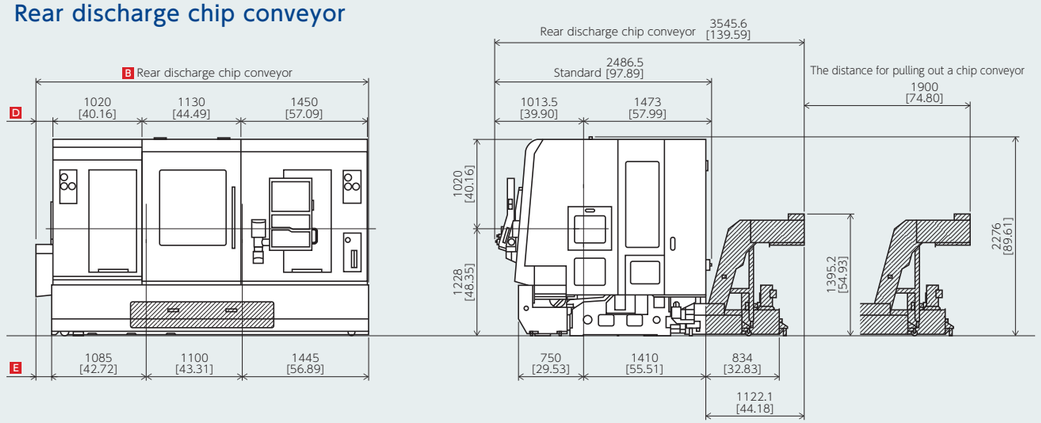
Machine Dimensions

Side discharge chip conveyor



mm[inch]

Rear discharge chip conveyor



A 4834[190.32] (Φ65)
4884[192.29] (Φ71, Φ80)
4954.2[195.05] (Φ102)

B 3815[150.20] (Φ65)
3865[152.17] (Φ71, Φ80)
3935[154.92] (Φ102)

C 4225[166.34] (Φ65)
4275[168.31] (Φ71, Φ80)
4345[171.06] (Φ102)

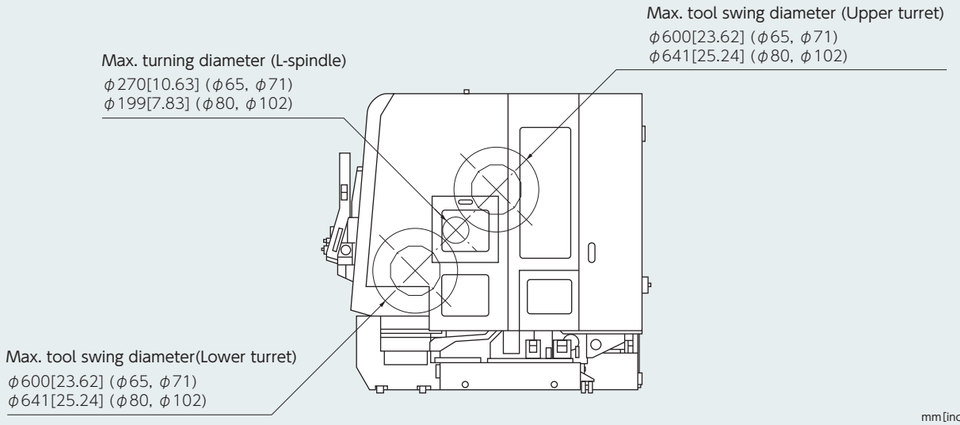
Side discharge chip conveyor
Rear discharge chip conveyor

D 200[7.87] (Φ65)
250[9.84] (Φ71, Φ80)
320[12.60] (Φ102)

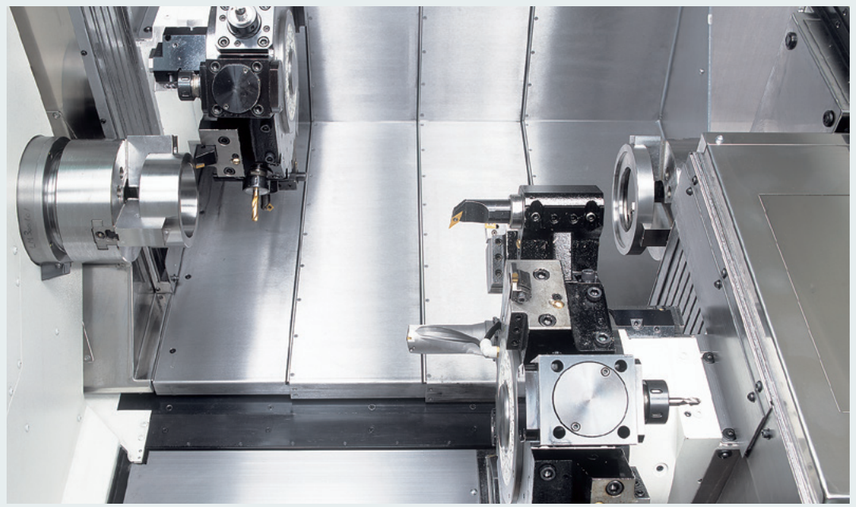
E 185[7.28] (Φ65)
235[9.25] (Φ71, Φ80)
275[10.83] (Φ102)

mm[inch]

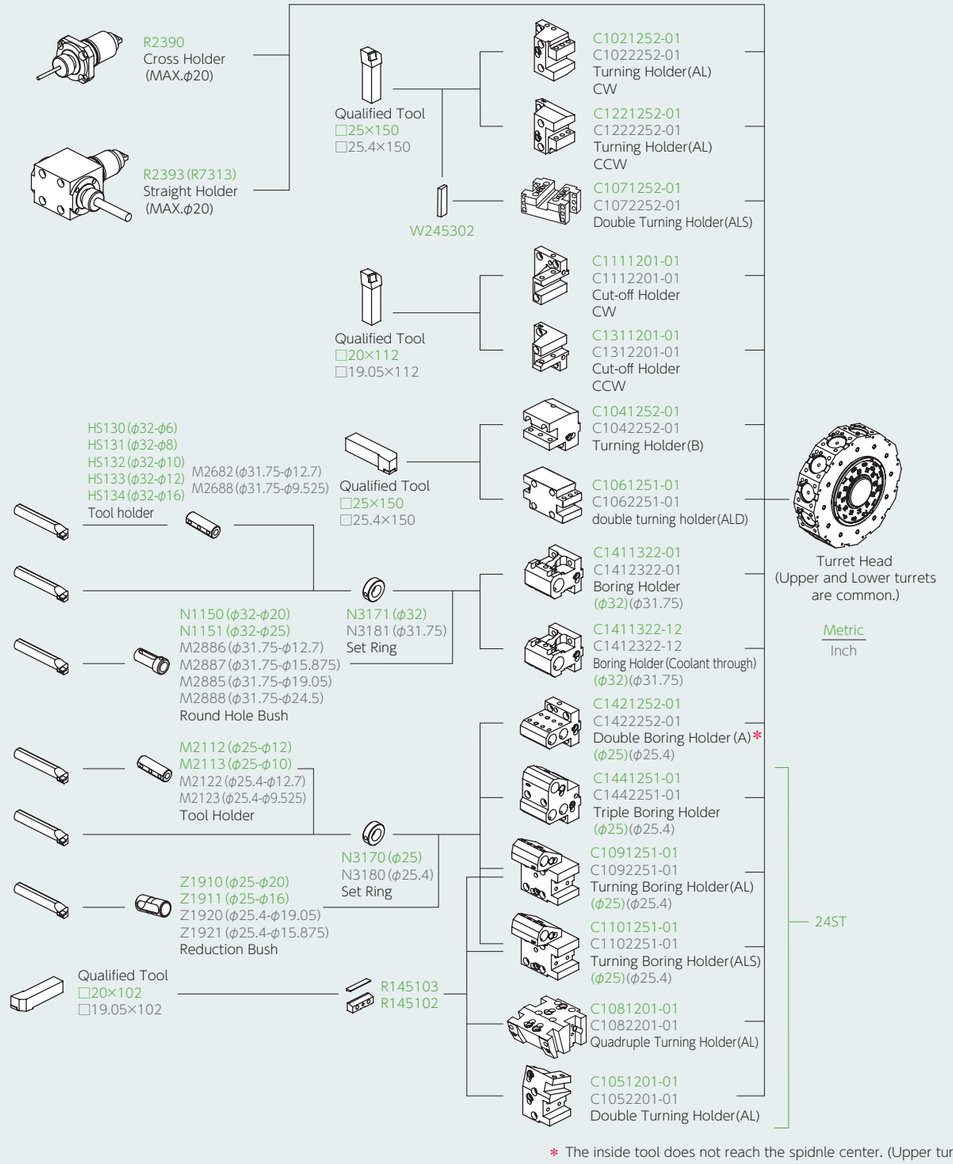
Maximum tool diameter



mm[inch]



Tooling System



* The inside tool does not reach the spidnle center. (Upper turret)

Machine• Control Specifications

■ Capacity

		ϕ65	ϕ71(op.)	ϕ80(op.)	ϕ102(op.)
Max. turning diameter	Upper	270mm		199mm	199mm
	Lower			270mm	270mm (L: ϕ102/R: ϕ65) 229mm (L: ϕ102/R: ϕ102)
Distance between spindles		max.1,100mm / min.250mm			
Max. turning length		780mm			
Bar capacity	L	ϕ51mm	ϕ71mm	ϕ80mm	ϕ102mm
	R		-	-	
Chuch size		8"		12"(305mm)	12"(315mm)

■ Axis travel・Rapid feed

X1-axis slide travel	195mm	188mm	152.5mm	152.5mm
X2-axis slide travel	195mm	195mm	195mm	195mm (L: ϕ102/R: ϕ65) 135mm (L: ϕ102/R: ϕ102)
Z1-axis slide travel	780mm			
Z2-axis slide travel	780mm			
Y-axis slide travel (op.)	±60mm		±40mm	
B2-axis slide travel	850mm			
X1 / X2 rapid feed rate	16m/min			
Z1 / Z2 rapid feed rate	27m/min			
Y rapid feed rate(op.)	6m/min			
B2 rapid feed rate	27m/min			18m/min (R: ϕ102)

■ L-spindle

Spindle speed	4,500min^{-1}	4,000min^{-1}	3,500min^{-1}	2,500min^{-1}
Spindle speed range	Stepless	Stepless	Stepless	Stepless
Spindle nose	A2-6	A1-8	A1-8	A2-8
Hole through spindle	80mm	85mm	90mm	120mm
I. D. of front bearing	110mm	120mm	120mm	160mm
Hole through draw tube	66mm	72mm	81mm	103mm

■ R-spindle

Spindle speed	4,500min^{-1}	-	-	2,500min^{-1}
Spindle speed range	Stepless	-	-	Stepless
Spindle nose	A2-6	-	-	A2-8
Hole through spindle	80mm	-	-	120mm
I. D. of front bearing	110mm	-	-	160mm
Hole through draw tube	66mm	-	-	103mm

■ C-axis (op.)

	ϕ65	ϕ71(op.)	ϕ80(op.)	ϕ102(op.)
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 tool stations	12 (Max. 24)
Number of indexing positions	24
Tool size (square shank)	□20mm / □25mm
Tool size (round shank)	ϕ25mm / ϕ32mm

■ Milling (op.)

Rotary system		Individual rotation
Milling spindle speed		3,600min^{-1}
Spindle speed range		Stepless
Number of milling stations		12
Holder type and Tool size	Straight holder	ϕ2mm- ϕ20mm
	Cross holder	ϕ2mm- ϕ20mm

■ Drive motor

L-spindle	15/11kW	Standard	op.	op.	op.
	18.5/15kW	op.	op.	op.	op.
	22/18.5kW	op.	op.	op.	op.
R-spindle	15/11kW	Standard	-	-	op.
	18.5/15kW	op.	-	-	op.
Milling (op.)		5.5/3.7kW			

■ General

Machine size	Height	2,276mm		
	Width	4,230mm	4,275mm	4,345mm
	Depth	2,487mm		
Machine weight (incl. control)		14,000kg		

●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)

■ Controlled axes

Controlled axes	7 axes / 8 axes	
Simultaneously controlled axes	Upper	3 axes (X1, Z1, C1 (C2) axis) / 4 axes (X1, Z1, C1 (C2) , Y axis)
	Lower	4 axes (X2, Z2 ,C2 (C1) , B2 axis) / 4 axes (X2, Z2 ,C2 (C1) , B2 axis)

■ Input command

Least input increment	0.001mm/0.0001inch (diameter for X-axis), 0.001°
Least command increment	X:0.0005mm / Z, Y:0.001mm / C:0.001° / B2:0.001mm
Max. programmable dimension	±99999.999mm/±9999.9999in, ±99999.999°
Absolute/Incremental programming	X, Z, C, Y, B (absolute only for B) /U, W, H, V
Decimal input	Standard
Inch / Metric conversion	G20 / G21
Programmable data input	G10

■ Feed function

Cutting feed	feed/min X, Z : 1-4800mm/min, 0.01-188inch/min Y : 1-4800mm/min 0.01-188inch/min C : 1-4800° /min B2 : 1-4800mm/min, 0.01-188inch/min feed/rev : 0.0001mm/rev-4800mm/min 0.000001in/rev-188in/min
Dwell	G04
Feed per minute / Feed per revolutioinn	G98 / G99
Thread cutting	G32F designation
Thread cutting retract	Standard
Continuous thread cutting	Standard
Variable leed thread cutting	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	G5.1
Spindle override	50%-120% Set every 10%

■ Program memory

Part program storage length / Number of registrable programs	256kbyte Total 640m	500
	512kbyte Total 1280m(op.)	1000
	1Mbyte Total 2560m(op.)	1000/2000
	2Mbyte Total 5120m(op.)	1000/4000
	4Mbyte Total 10240m(op.)	1000/4000
	8Mbyte Total 20480m(op.)	1000/4000
Part program editing	delete, insert, change	
Program number search	Standard	
Sequence number search	Standard	
Address search	Standard	
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 (used for C-axis control from lower)
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)
Luch-bei II / NT Manual Guide i	Standard
Abnormal load detection function	Standard
NT WOKR NAVIGATOR	Standard (not including contact bar)
NT NURSE	Standard
NT Machine Simulation	Standard
NT Collision Guard	Standard

■ Machine support functions

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

■ ECO functions

Servo motor power off	Standard (Switch on Power Saving Mode in NT Setting sreen)
Control of motor output during accel. and decel.	Standard (Switch on Power Saving Mode in NT Setting sreen)
G-code for servo motor energy-saving during accel. and decel.	G356 / G357
Fan motor on/off	Standard (controls motor fan on/off according to spindle motor temperature)
Automatic light off	Standard (Switch on Power Saving Mode in NT Setting sreen)
Automatic monitor off	Standard (Switch on Power Saving Mode in NT Setting sreen)

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