

NTY³-150

NAKAMURA-TOME
PRECISION INDUSTRY CO.,LTD.

NTY³-150

High Productivity Multitasking Machine

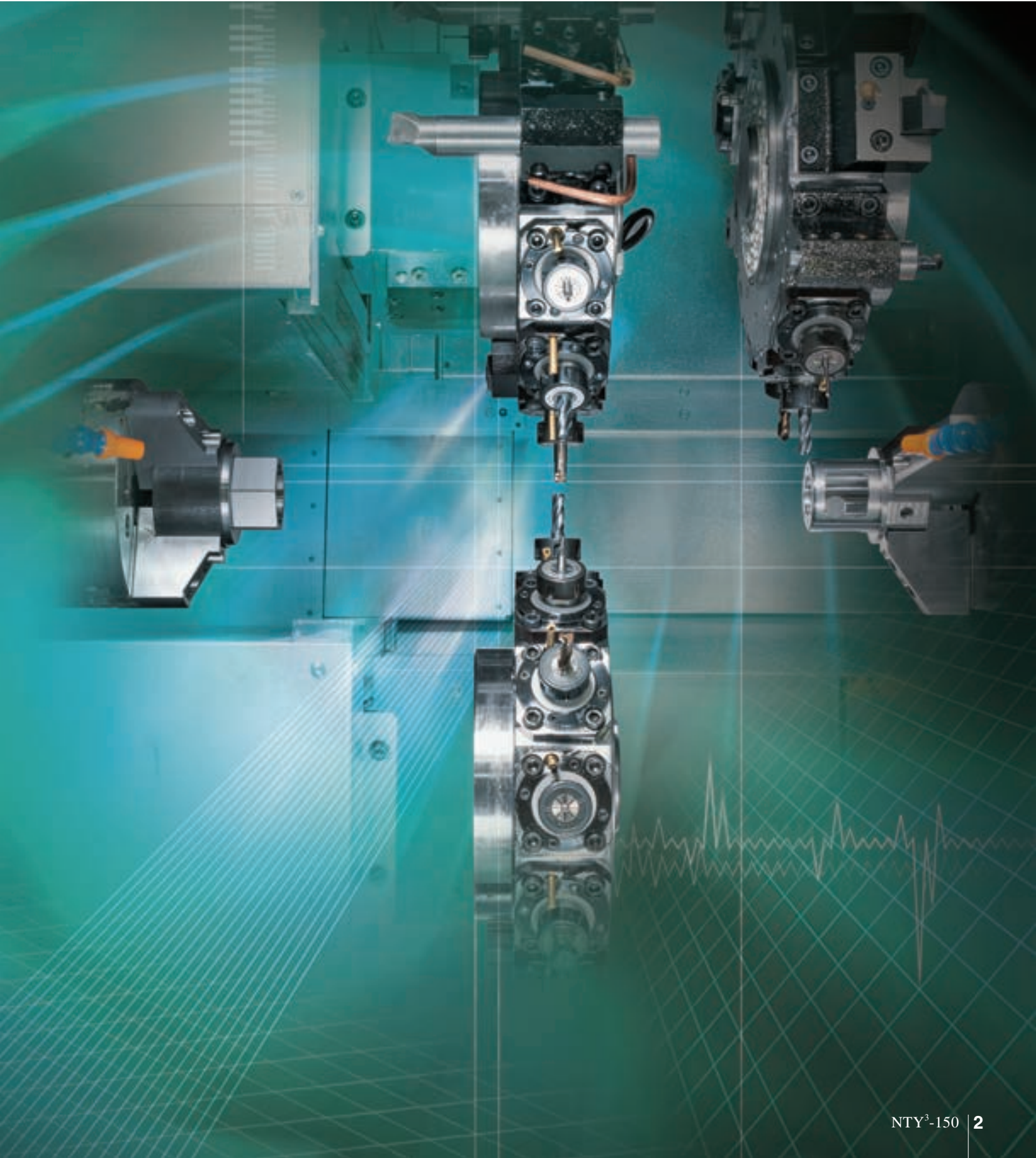
From diversified small-lot production to mass production

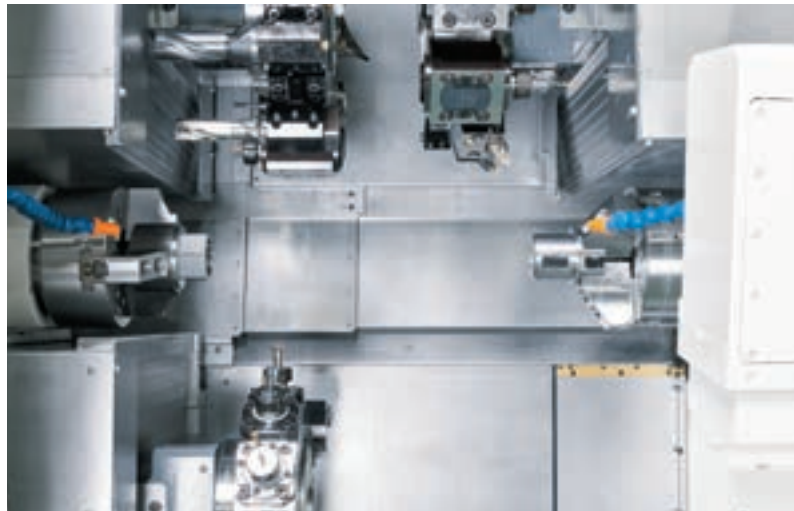
3 Turrets 3 Y-axes

One hit machining
Finished parts, complete in one setup



Wider working range with L/R Z-axis Cross-over travel





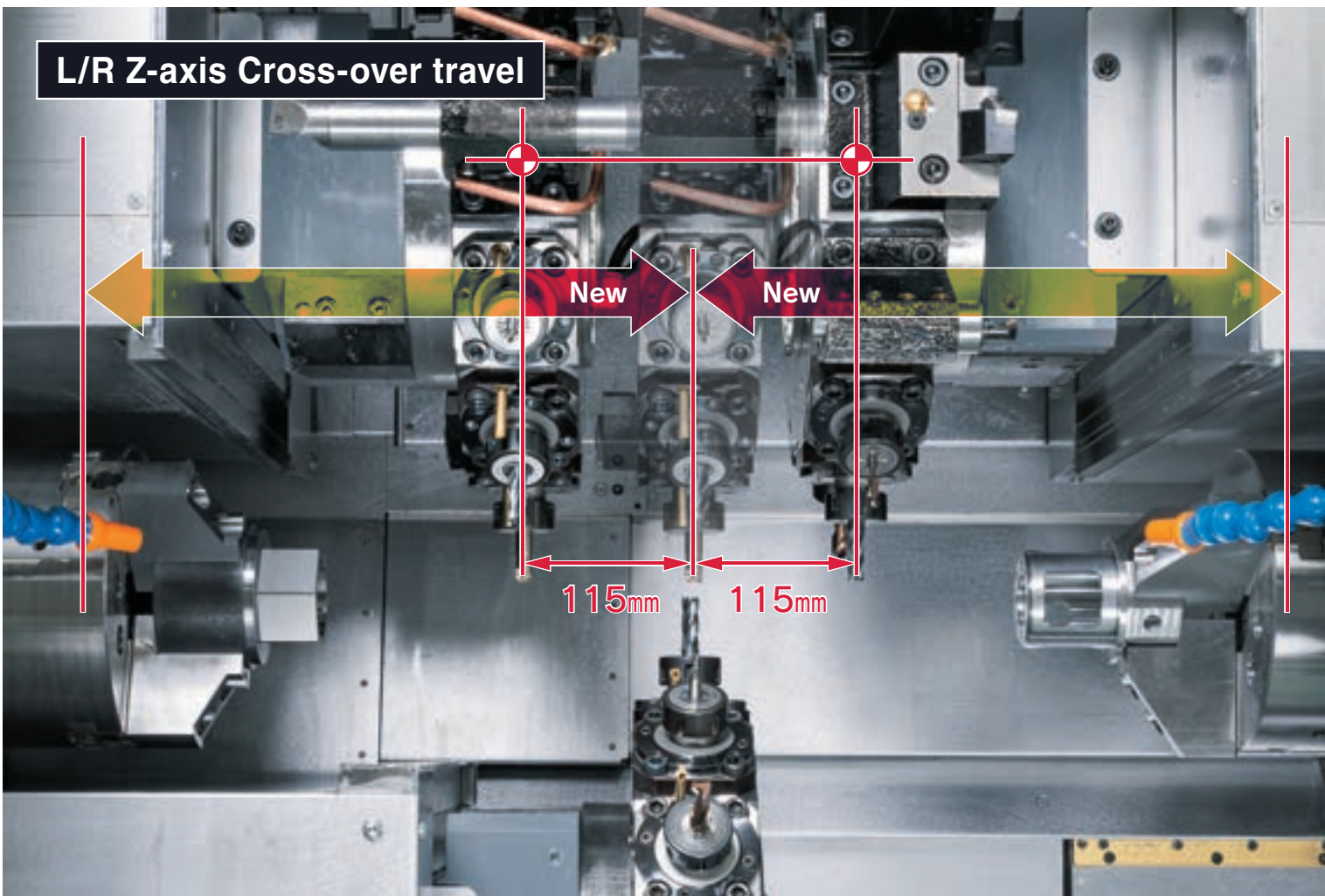
High Productivity

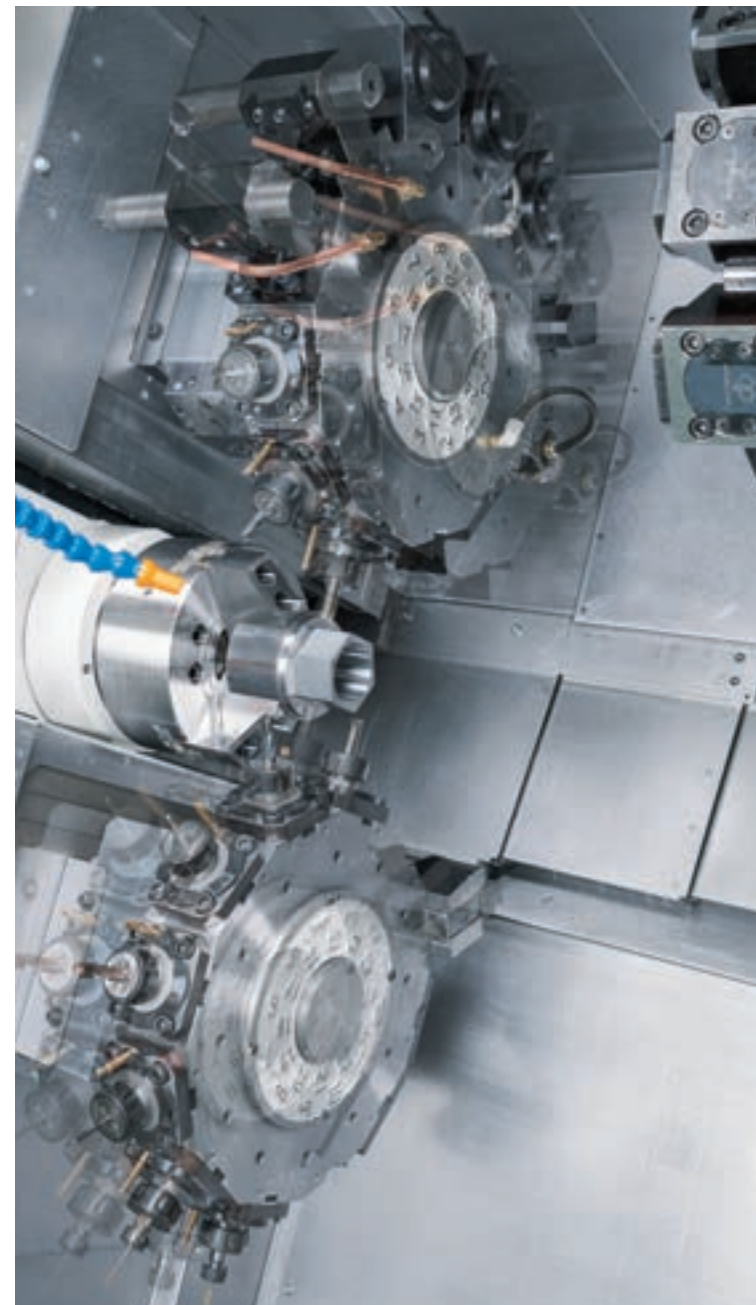
Top Leader of One-hit Machining

No work in process

Less setup time

Complete in one setup





Simultaneous Milling with upper / lower tool on left spindle.



Simultaneous Milling with upper / lower tool on right spindle.

72

12 / 24 - Station Turret

24 + 24 + 24

Up to 72 tool stations
for Turning, 48 tool stations
for milling tools.

**Double
Performance!**

M_{x3}

Milling-tool motor
5.5/3.7kW × 3

**Y-axis on upper
and lower turrets**

Y_{x3}

Y-axis travel
Upper : ±45mm
Lower : ±35mm



NTY³-150

**Now with Z-axis
cross-over travel**

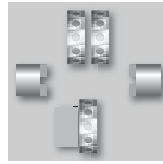
High-Performance



State-of-the art Multitasking machine

19"
Color LCD
Touch Panel

NT
Smart
X



T_{x3}
Three turret

M_{x3}
Three Milling Motor

Y_{x3}
Three Y-axes

S_{x2}
Twin-Spindle

C_{x2}
C-axes

B₂
B-axis

Capacity	φ51mm	φ65mm
Max. turning diameter	225mm	
Max. turning length	685mm	
Distance between spindles	max. 970mm / min. 200mm	
Bar capacity	φ51mm	φ65mm
Chuck size	165mm (6")	
Axis travel		
Slide travel (X1 / X2 / X3)	160.5 / 160.5 / 160.5mm	
Slide travel (Z1 / Z2 / Z3)	235 / 235 / 685mm	
Slide travel (Y1 / Y2 / Y3)	±45 / ±45 / ±35mm	
Slide travel (B)	770mm	
Spindle L, R		
Spindle speed	5,000min ⁻¹	4,500min ⁻¹
Spindle motor output (L / R)	15/11kW / 11/7.5kW	
Turrets		
Number of turrets (Upper / Lower)	2 / 1	
Driven-tool spindle speed	6,000min ⁻¹	
Drive motor	5.5/3.7kW 24/16N·m	
Type of turret head / Number of indexing pos.	Dodecagonal drum turret / 24	
Drive type / Number of driven-tool stations	Individual rotation / 12	
General		
Floor space (L×W×H)	3,814mm × 2,218mm × 2,200mm	
Machine Weight (incl.control)	10,000kg	

NTY³-150

72 stations

High-rigidity turrets

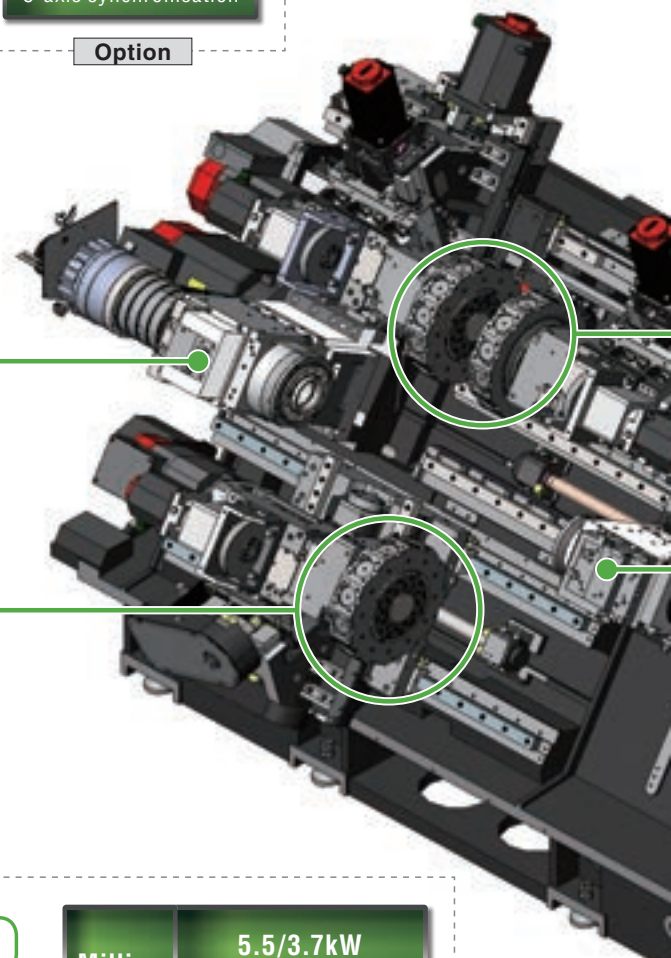
Upper Turrets × 2



Lower Turret × 1

Bar capacity $\phi 51\text{mm}$	Bar capacity $\phi 65\text{mm}$
Spindle motor 15 / 11kW 5,000min ⁻¹	Spindle motor 15 / 11kW 4,500min ⁻¹
C-axis C-axis synchronisation	C-axis C-axis synchronisation
Standard	Option

Left Spindle



Lower Turret × 1

12 / 24 station turret

- ◆ Number of driven-tool stations : 12
- ◆ Servo-driven turret

Milling motor	5.5/3.7kW 24/16N·m 6,000min ⁻¹
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Y-axis travel $\pm 35\text{mm}$

Standard

Ensures Stable Accuracy

12 / 24 station turret

- ◆ Number of driven-tool stations : 12
- ◆ Servo-driven turret

Milling motor
5.5/3.7kW
24/16N·m
6,000min⁻¹

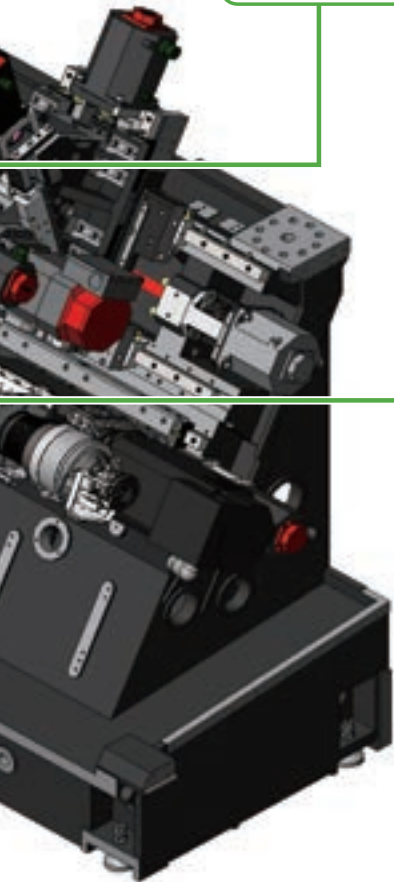
Y-axis travel ±45mm

Standard

Larger window ensures better visibility



Upper Turrets x2



Right Spindle

Bar capacity ϕ 51mm

Spindle motor

11 / 7.5kW
5,000min⁻¹

C-axis

C-axis synchronisation

Standard

Bar capacity ϕ 51mm

Spindle motor

15 / 11kW
5,000min⁻¹

C-axis

C-axis synchronisation

Option



Parts catcher G

Option

Method		Swing / Gripper
Workpiece size	Diameter [mm]	ϕ 12 - 65
	Length [mm]	15 - 150
	Weight [kg]	3.0
Ejecting method		Belt conveyor & Chute



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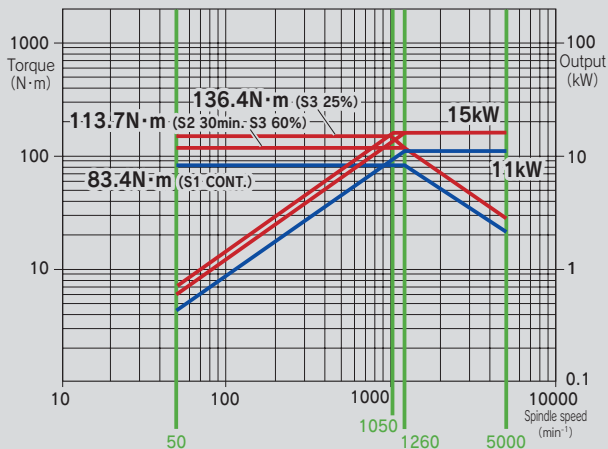
Simultaneous machining with synchronized left and right spindles contribute to faster cycle times.

Left Spindle Motors

15 / 11kW

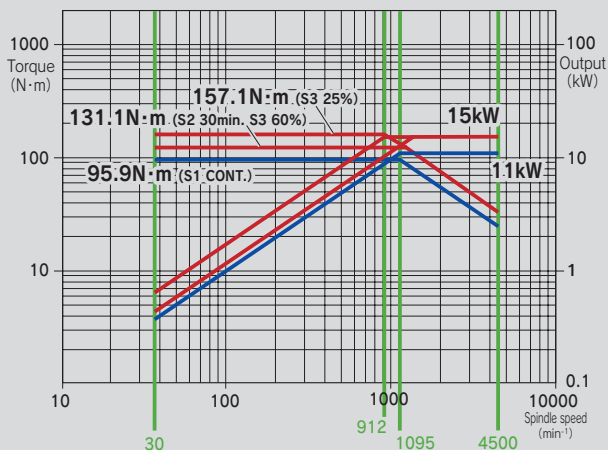
Standard

Rotating speed : 5,000min⁻¹ φ51mm



Option

Rotating speed : 4,500min⁻¹ φ65mm

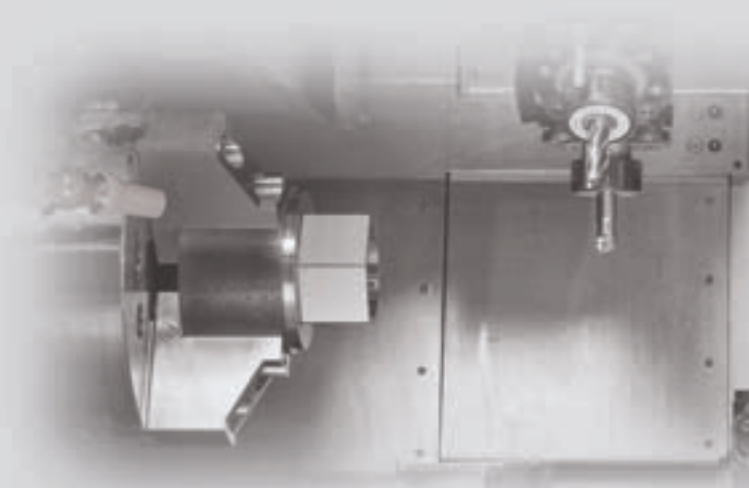
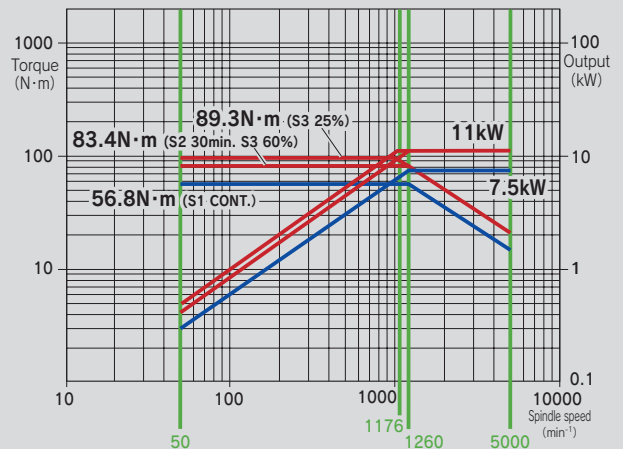


Right Spindle Motors

11 / 7.5kW

Standard

Rotating speed : 5,000min⁻¹ φ51mm



Milling Motors.

From simple to complex parts
One hit machining from raw material to finished part

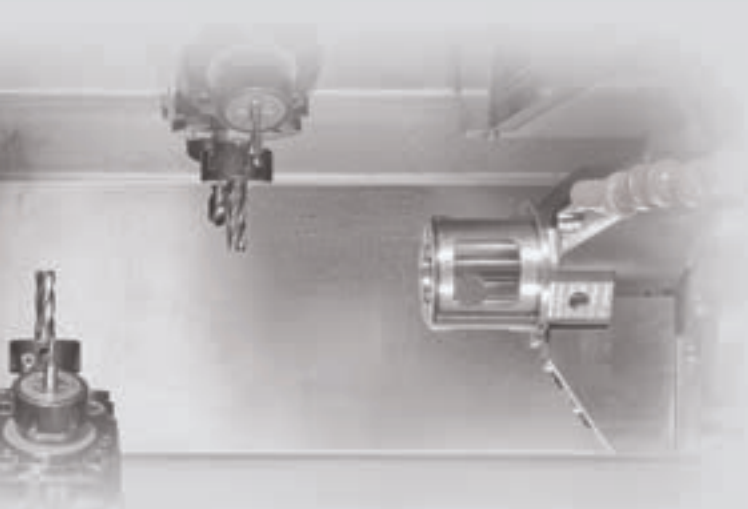
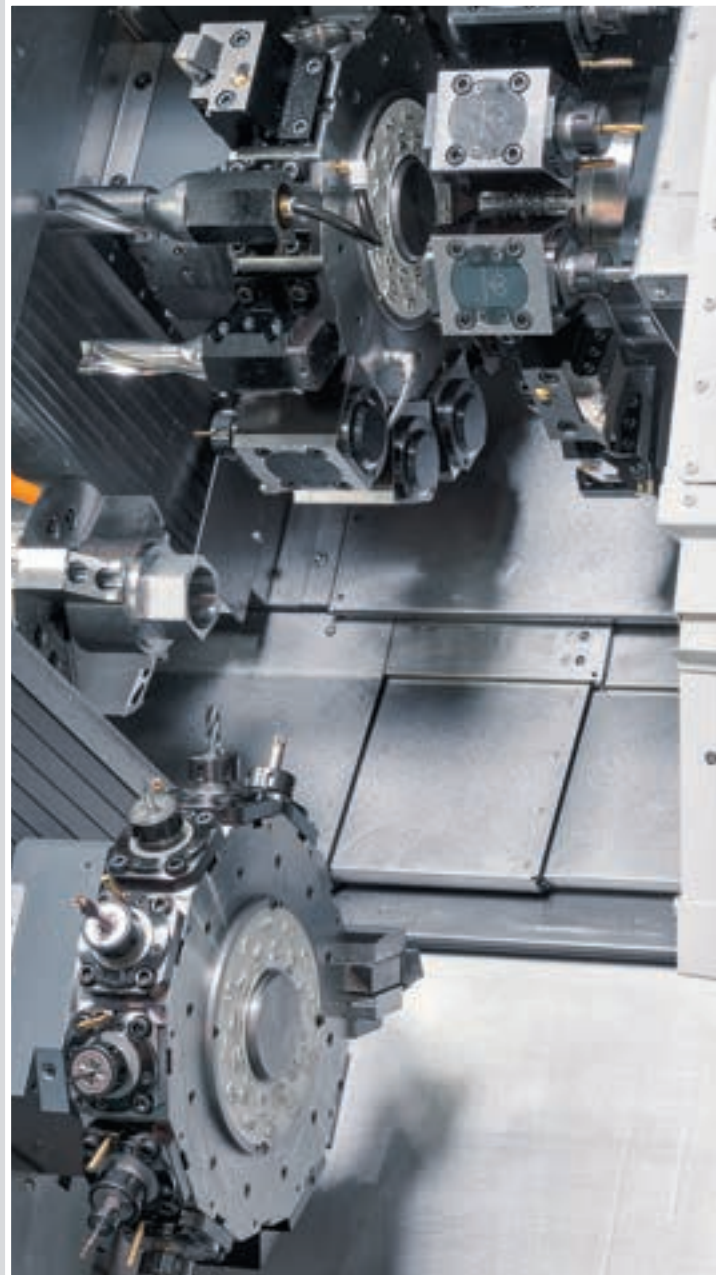
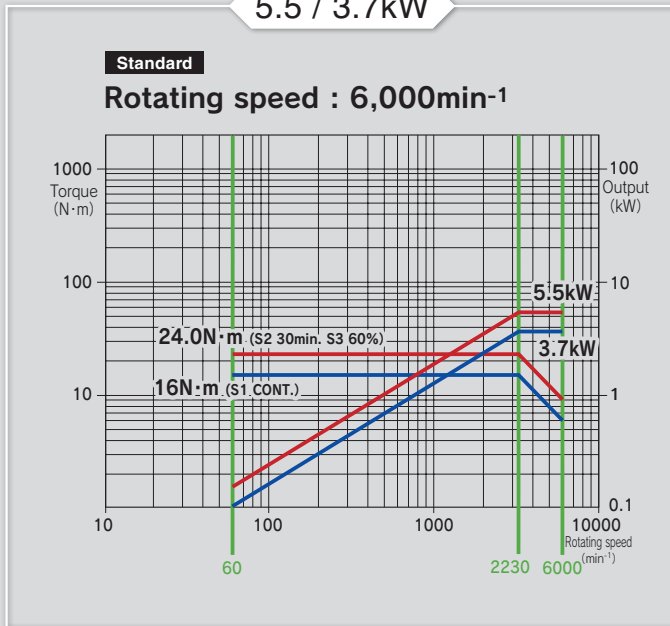


NTY³-150

In addition to milling or drilling simultaneously with upper and lower turrets, improved chip-removal capabilities contribute to drastically faster cycle times.

Upper & Lower Milling Motors

5.5 / 3.7kW



Advanced Production System

Big Data

IoT

Industry 4.0



Cut-in Check

- 19 inch color LCD Touch panel • PC memory 8GB • QWERTY Key board • Windows 8 • Touch Pad • USB 2.0 port × 2

Program storage length	Total 512Kbyte (1,280m)	Total 1Mbyte (2,560m)	Total 2Mbyte (5,120m)	Total 4Mbyte (10,240m)	Total 8Mbyte (20,480m)
Program registered number	Total 1,000	Total 1,000 or Total 2,000	Total 1,000 or Total 4,000		
Tool offset pairs	99 + 99 + 99 (op. Total 999)				

Standard / Option

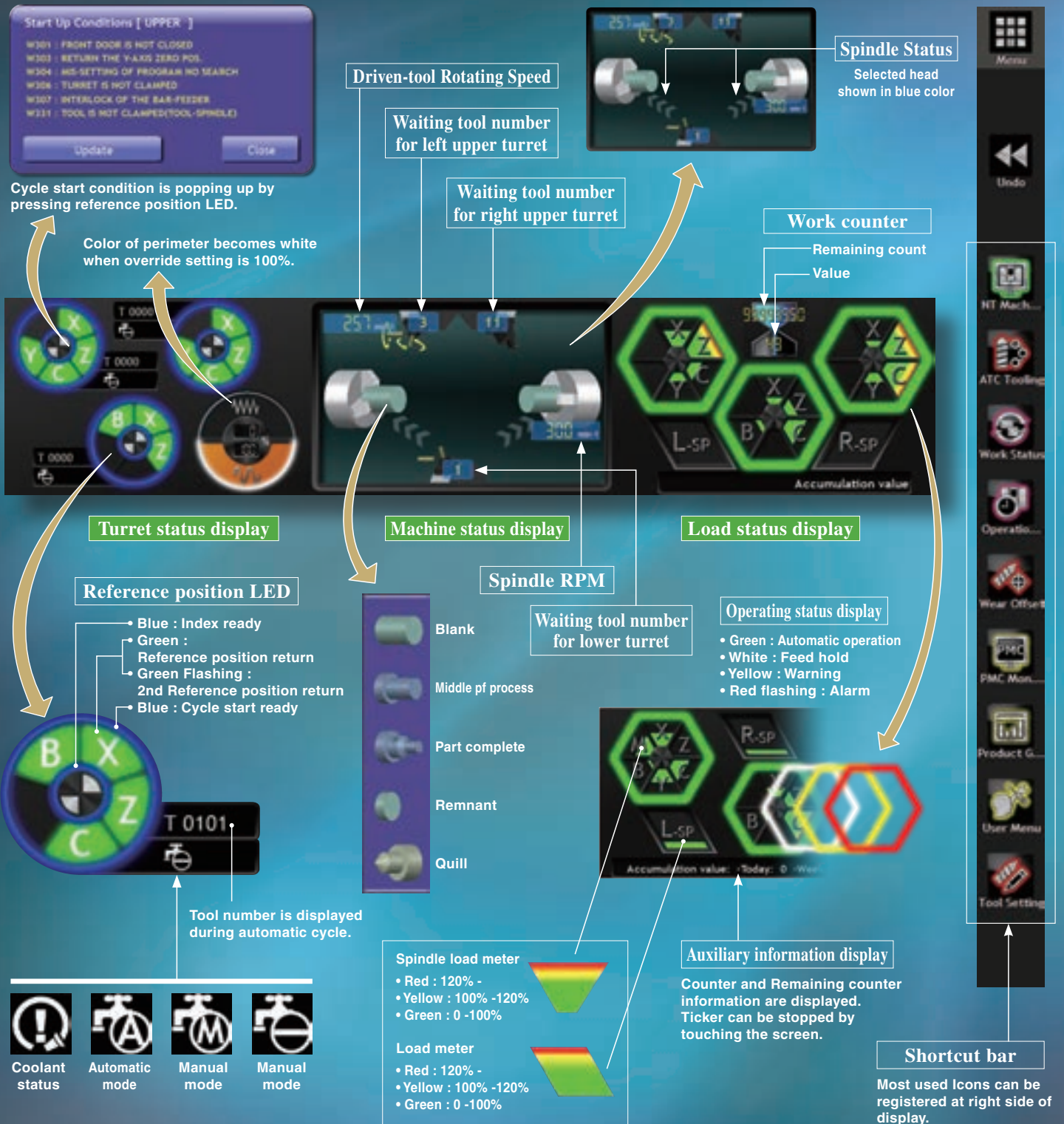
Main features

- NT Manual Guide i
- NT Work Navigator
- Airbag (Overload detection)
- Advanced NT Nurse
- Status Display Function
- Setup Display
- Trouble Guidance
- Productivity Function
- Operation Level Control Function
- Warm up Function
- Built-in Loading Device Setting Screen (op.)
- Parts Catcher G Operation Function (op.)
- NT Machine Simulation
- NT Collision Guard
- NT Multitasking Office (op.)
- Net Monitor (op.)
- 3D Smart PRO



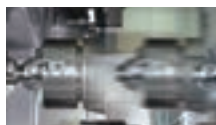
Cut-in Check

The machine can be stopped immediately while in automatic cycle. After reading G00 command in the machining program, the Spindle, Tool spindle, Axis Feeding and Coolant will stop. It is faster than M01 optional stop. After checking the machine internal status, the machining can be restarted by pressing "Program restart" button.



G131 Soft work pusher

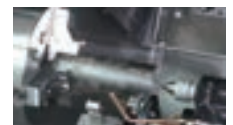
This cycle is used during part transfer from left to right side spindle. Once part contact with the jaws or stopper of the right side spindle has been confirmed, the right side spindle servo axis stops.



- Contact force can be changed in the program.
- It is possible to set OK/ NG range as well.
- An additional work pusher for the right side is not required and cycle time can be reduced.

G376 Soft quill pusher cycle

Thrust force of center support can be set in the program by using servo motor technology, which help keep a constant pushing thrust during cutting.



- It is available for Z axis and B2 axis.
- Quill thrust force can be changed in the program.
- It is possible to set OK/ NG range as well.

Dual safety

NT Machine Simulation / NT Collision Guard



Airbag

Dual safety

Double safety features for maximum protection

NT collision Guard to avoid machine collision and Air bag function (Abnormal load detection) to minimize damage even in case of collision.

NT Machine Simulation

Prevent the collision due to tooling, chuck, and program.



Simulation is performed to check the programs without running the machine. This helps prevent machine collisions due to programming or setup errors.

"Distance to go" and "Modal information" can be checked during with simulation.

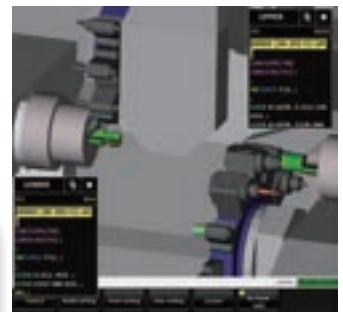
Rapid feed and Cutting feed can be adjusted using override setting. It is possible to make Simulation of each process, or to use single block.

Process

Single block



Simulation of part machining. There are several view screen display settings, such as machine display, turret display and tooling display.



It is possible to choose between "with" or "without" program display. The color of the program block being simulated can be set to be displayed in a different color.

NT Collision Guard

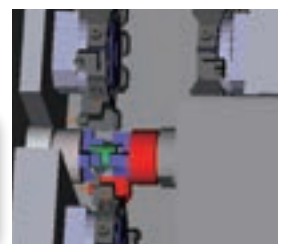


Preventive safety technology - Machine collisions are avoidable!

This function is available in automatic mode and manual mode. Collisions can be prevented, especially after modifying the program, or changing the tool geometry offset. Registered machine data, chucks, tools, holders, and parts are used to monitor the machine during automatic, manual or jog movement, and recognize in advance collisions before they happen. Even turret indexing is monitored to avoid collisions, drastically reducing machine collision risks, especially during set up.

• Model setup was simplified.

Type of tool being indexed is automatically sorted out from the program, and the tool model can be selected from a displayed list.





NT Work Navigator

New Navigator for X-axis and Y-axis

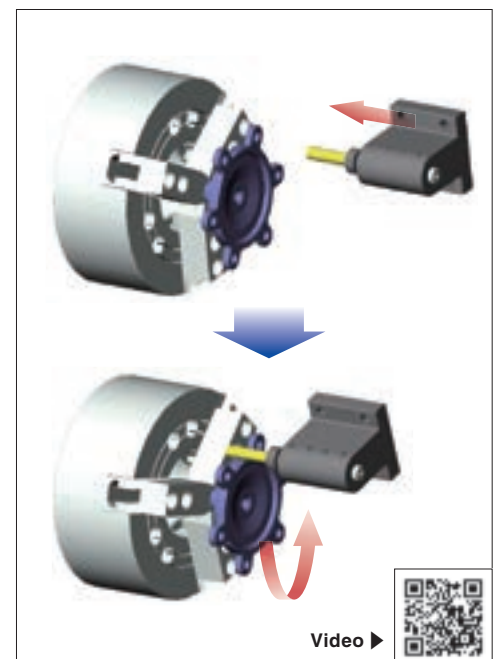


• Advanced NT Work Navigator !

Navigation function is expanded to also include the X and Y-axis. Coordinate Recognition can made the part's outer surface in the X or Y-Axis direction.

• No fixtures 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.

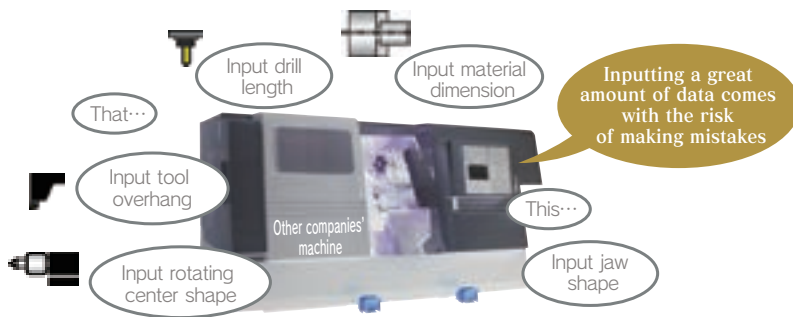


Airbag (Overload detection)

Nakamura-Tome machines will not break for the slightest collision, as other machines do. The function minimize damage in case of collision.

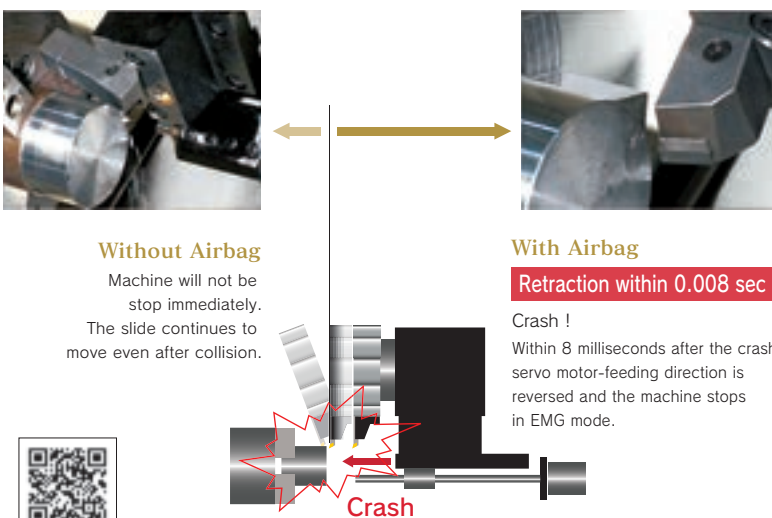
Even with barrier function, machine collisions may occur

Soft barrier function is not perfect.
If wrong data is input, a collision will occur.



When unavoidable human error results in machine collision, there is no reason to panic.

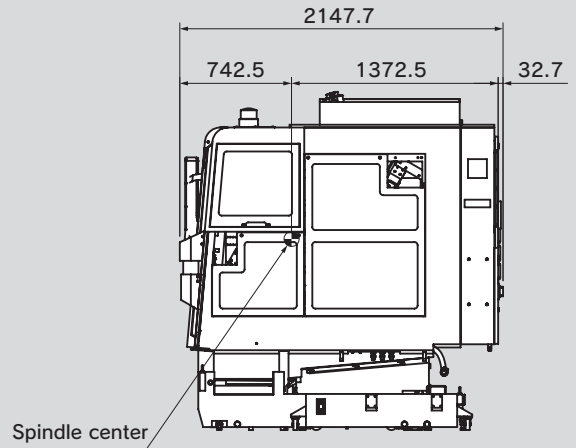
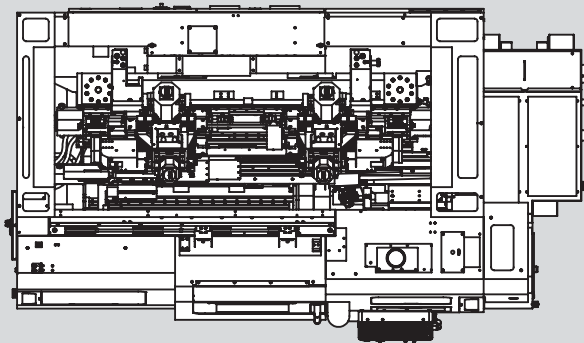
All Nakamura-Tome machines are equipped with a safety feature called "airbag" (overload detection), which will greatly reduce the impact force and prevent heavy damage to the machine.



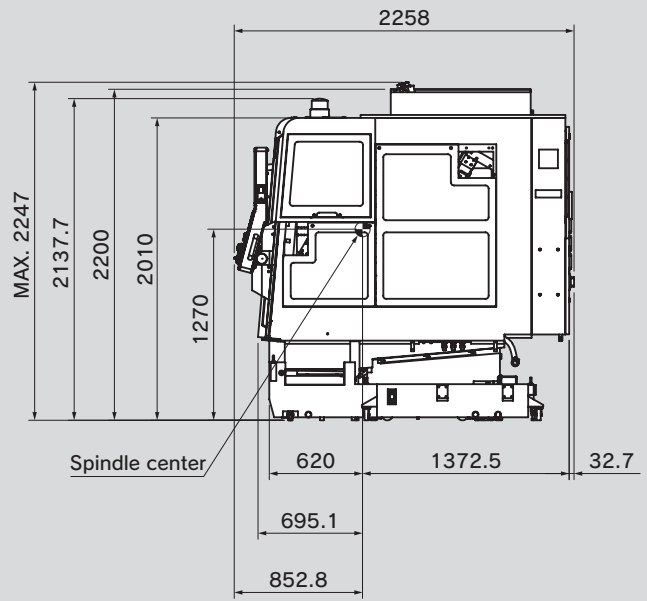
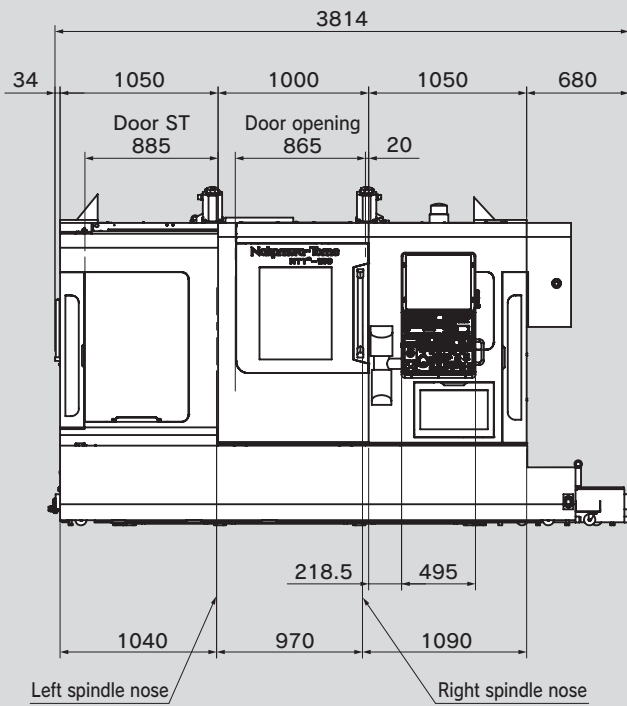
▲ Video

* This feature does not mean zero impact.

Machine Dimensions



Dimensions : when control panel is stored away for transport.



Unit : mm

NTY³
3T 3Y
S E R I E S

NTY³-100



φ 42 ←←←

6" ←←←

Machine Specifications



Capacity	φ51mm	φ65mm (op.)
Max. turning diameter	225mm	
Standard turning diameter	150mm	
Distance between spindles	max. 970mm / min. 200mm	
Max. turning length	685mm	
Bar capacity	51mm	65mm
Chuck size	165mm (6")	
Axis travel		
Slide travel (X1 / X2 / X3)	160.5mm / 160.5mm / 160.5mm	
Slide travel (Z1 / Z2 / Z3)	235mm / 235mm / 685mm	
Slide travel (Y1 / Y2 / Y3)	±45mm / ±45mm / ±35mm	
Slide travel (B)	770mm	
Rapid feed X1 / X2 / X3	20m/min ⁻¹	
Rapid feed Z1 / Z2 / Z3	40m/min ⁻¹	
Rapid feed B axis	40m/min ⁻¹	
Rapid feed Y1 / Y2 / Y3	8m/min ⁻¹	
Left and right spindles		
Spindle speed	5,000min ⁻¹	4,500min ⁻¹
Spindle speed range	Stepless	
Spindle nose	A2-5	A2-6
Hole through spindle	65mm	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 index speed	600min ⁻¹	
Cutting feed rate	1- 4800°/min	
C-axis clamp	Disk clamp	
C-axis connecting time	1.5 sec.	
Upper & Lower turrets		
Type of turret head	Dodecagonal drum turret	
Number of driven-tool stations	12	
Number of index positions	24	
Tool size (square shank)	□25mm	
Tool size (round shank)	φ32mm	
Rotating tool		
Rotary system	Individual rotation	
Driven-tool spindle speed	6,000min ⁻¹	
Spindle speed range	Stepless	
Number of driven-tool station	12	
Tool shank	Straight holder φ1mm - φ16mm Cross holder φ1mm - φ16mm	
Drive motor		
L-spindle	15/11kW	
R-spindle	11/7.5kW (op.15/11kW)	
Driven tools	5.5/3.7kW	
General		
Height	2,200mm	
Floor space (L x W)	3,814mm x 2,218mm	
Machine weight (incl. control)	10,000kg	
Power requirements		
power supply	43.8kVA	
Air supply	400 - 450NL/min, 0.5 - 0.7MPa	

- Safety devices such as various interlocks, fences for robotics, auto loading device, work stocker, automatic fire extinguisher etc. are available as options which can be included in your purchase package. Please contact our local distributor and dealer for your specific requirements.

Precautions about the use of cutting coolant

Synthetic Coolants are Damaging to Machine Components. Concerning the use of cutting fluids, cautions have to be taken on the type of coolant being used. Among coolants available in the market, some types are damaging to machine components and should be avoided. Typical damages are turcite wear, peeling of paint, cracking and damage to plastics and polymers, expansion of rubber parts, corrosion and rust build up on aluminum and copper. To prevent such damages, coolants that are synthetic, or containing chlorine have to be avoided. Machine warranty terms do not apply to any claims or damage arising from the use of improper coolant.

Control Specifications



items	
Control type	FANUC 31i-B 3-PATH
Controlled axes	
Controlled axes	13axes
Least command increment	L Upper : 4axes (X1, Z1, C1, Y1) R Upper : 4axes (X2, Z2, C2, Y2) Lower : 4axes (X3, Z3, C3 [C1, C2], Y3, 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, ±999999.999°
Absolute / incremental programming	X, Z, C, Y, B2 (absolute only for B2) / U, W, 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 - 314in/min (1 - 4800mm/min, 0.01 - 188in/min) Z : 1 - 8000mm/min, 0.01 - 314in/min (1 - 4800mm/min, 0.01 - 188in/min) C : 1 - 4800°/min Y : 1 - 8000mm/min, 0.01 - 314in/min (1 - 4800mm/min, 0.01 - 188in/min) B2 : 1 - 8000mm/min, 0.01 - 314in/min (1 - 4800mm/min, 0.01 - 188in/min) feed / rev : 0.0001 - 8000.0000mm/rev (0.0001 - 4800.0000mm/rev) 0.000001 - 50.00000in/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 values.
Dwel	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
Rapidfeed override	F0, 25, 50, 100% (changeable to every 10% by switch)
Cutting feedrate override	0 - 150% (each 10%)
AI contouring control I	G5.1
Spindle override	50% - 120% Set every 10%
Program memory	
Part program storage length	512kbyte (Total 1,280m)
Part program editing	delete, insert, change
Program number search	Standard
Sequence number search	Standard
Address search	Standard
Number of registerable programs	1,000 programs
Program storage memory	Backed up by battery
Multiple program simultaneous editing	Standard
DNC operation through memory card	Standard (Only one turret can access memory card at a time) (not including memory card)
Extended part program editing	Standard (Replacement of word, address, cut & paste for word / character, cancel operation, copy or move the program)
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
Axis recomposition	Standard (used for L C-axis control - R C-axis control from the lower side)
Sub program	Standard
Balance cut	G68, G69
Custom macro	Standard (common variable#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 Collision Guard	Standard
Mechanical support	
Rigid type	Standard
Spindle synchronised control	Standard
C axis synchronised control	Standard (G496 C1, fast forward positioning)
Spindle orientation	Standard
NT Smart X	
O/S	Windows Embedded 8.1 Industry PRO
Pointing device	Touch pad
Memory	8GB



NAKAMURA-TOME PRECISION INDUSTRY CO., LTD.

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