

NTY³-250

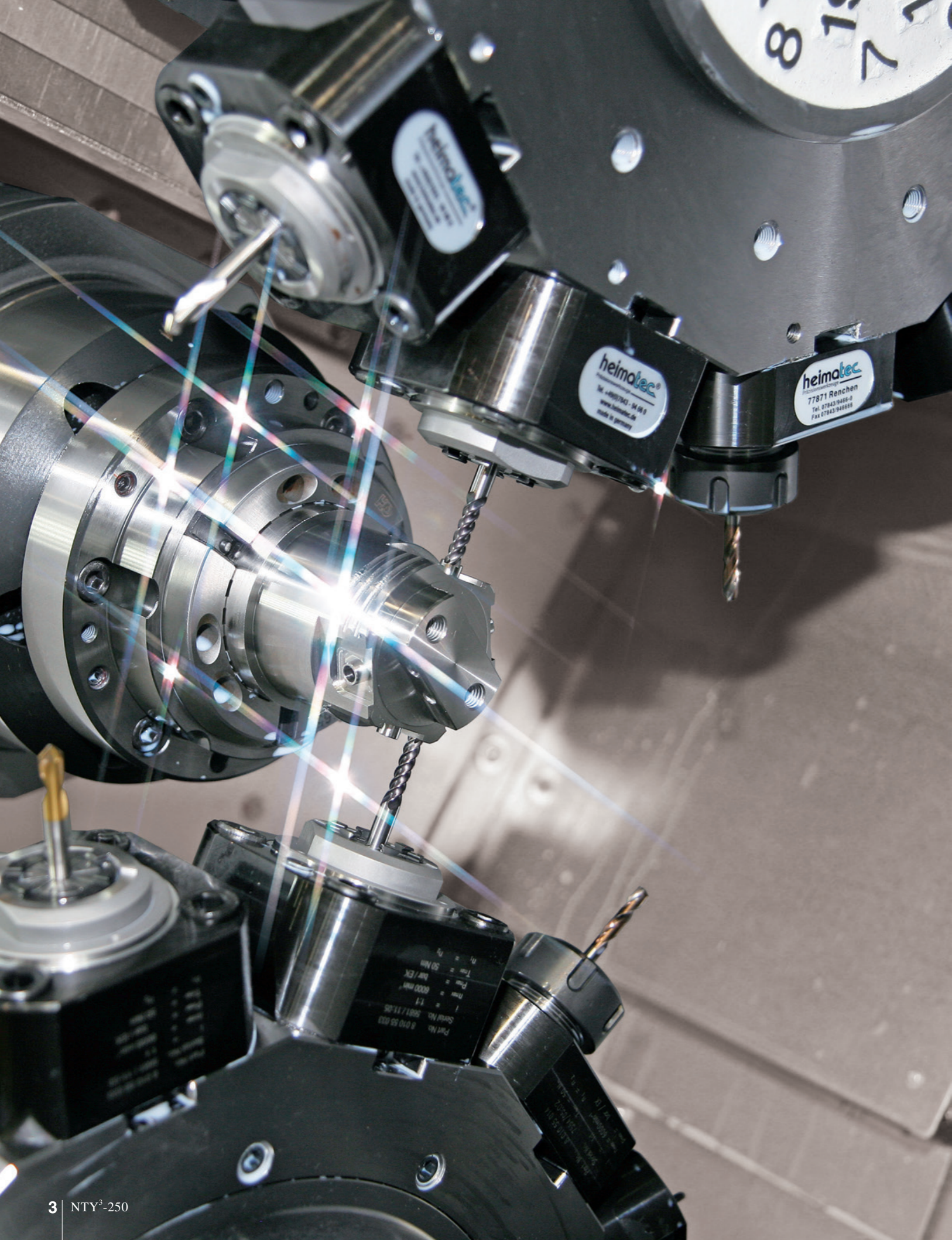
NAKAMURA-TOME
PRECISION INDUSTRY CO.,LTD.

New Model Added to the NTY³ Series

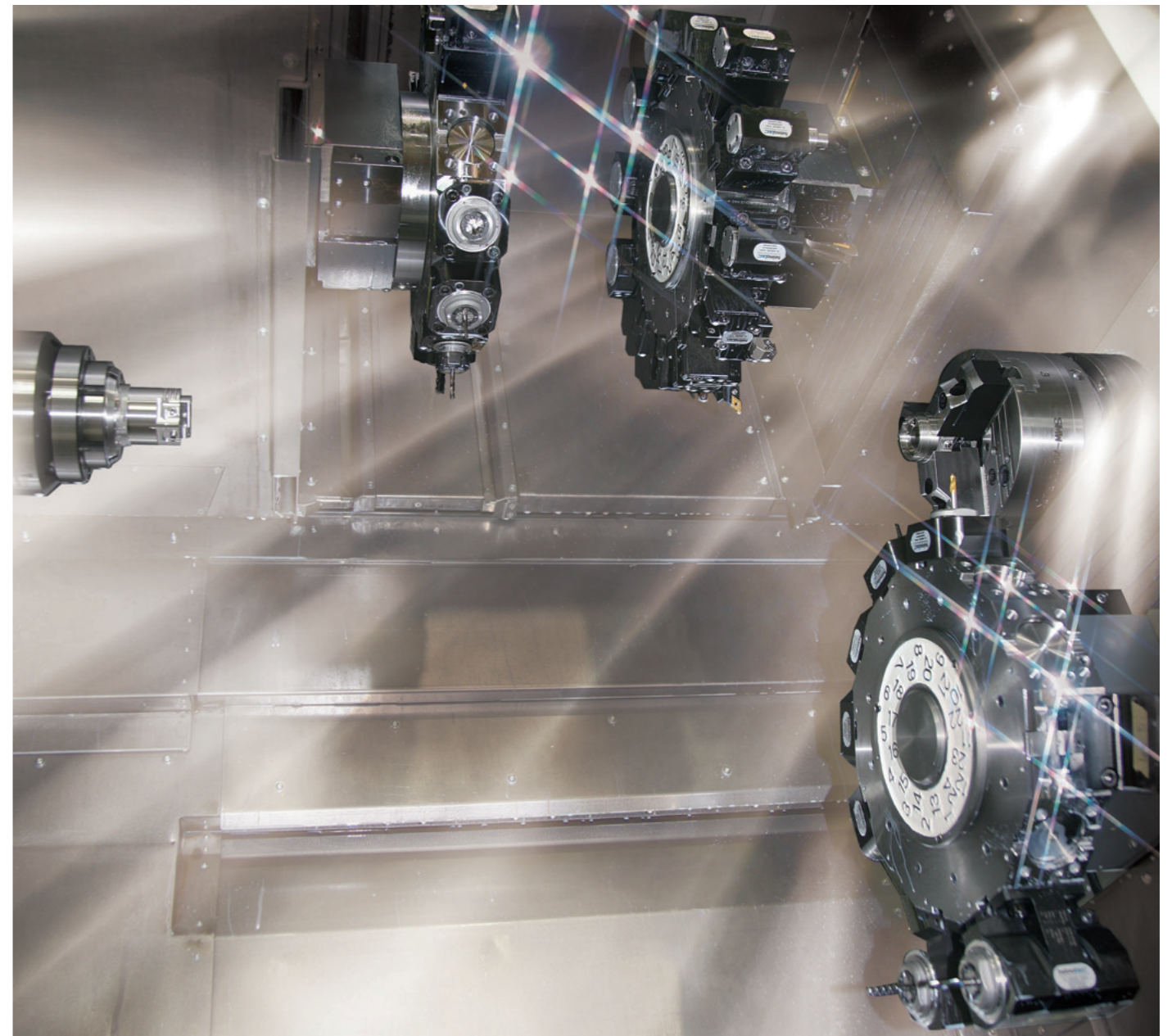
The Latest High Productivity
Three-Turret Multitasking Machine

- T³** 3 Turrets
- Y³** 3 Y-axes
- M³** 3 Milling Units





3 TURRETS WITH EQUAL PERFORMANCE & CAPABILITIES

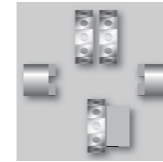




19" Color LCD Touch Panel

SMART X

With driven-tools and Y-axis offered as standard equipment



Capacity	φ 51mm	φ 65mm	φ 71mm
Max. turning diameter / Max. turning length	225mm / Upper turrets 310.5mm Lower turrets 905.5mm		
Distance between centers	Max.1200mm / Min.255mm		
Bar capacity	51mm	65mm	71mm
	L-spindle	-	Standard
	R-spindle	Standard	Option
Chuck size	210mm (8") / 165mm (6")		

Axis travel	
Slide travel (X1/X2/X3)	160.5mm / 160.5mm / 165mm
Slide travel (Z1/Z2/Z3)	355mm / 355mm / 910mm
B-axis Slide travel	945mm
Slide travel (Y1/Y2/Y3)	-61, +51 / -61, +51 / -51, +61mm

Spindle L, R			
L-spindle motor torque / Spindle speed			
Standard	18.5 / 11kW	-	190 / 156.8N·m / 5000min ⁻¹
High torque specification		-	244 / 201N·m / 4000min ⁻¹
Option	26 / 22kW	-	222 / 156N·m / 5000min ⁻¹
High torque specification		-	285 / 201N·m / 4000min ⁻¹
R-spindle motor torque / Spindle speed			
Standard	18.5 / 11kW	169 / 120 / 86 / 63N·m / 5000min ⁻¹	-
Option		-	180 / 120 / 86 / 63N·m / 5000min ⁻¹
High torque specification		-	186.6 / 124.4 / 89 / 65.3N·m / 4000min ⁻¹

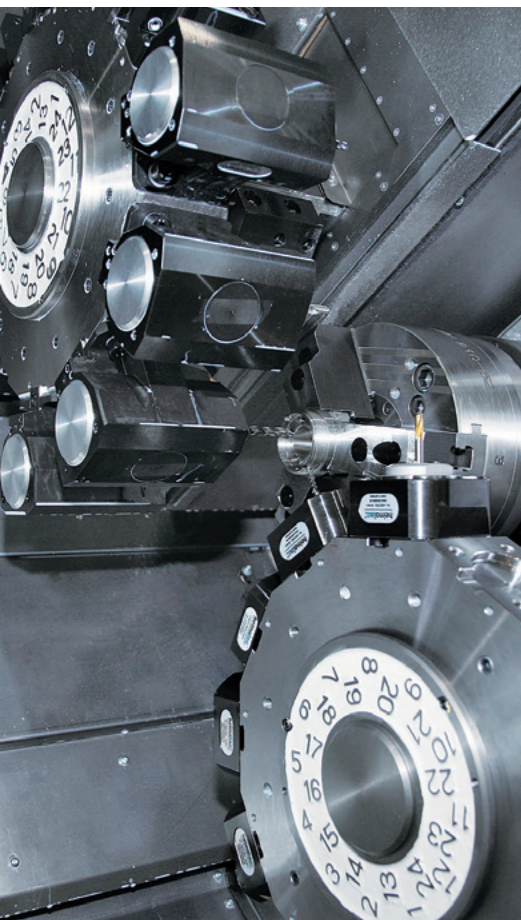
Upper turrets	
Number of turrets	2
Driven-tool spindle speed	6000min ⁻¹
Drive motor	5.5/3.7kW 24/16N·m
Type of turret head / Number of indexing position	Dodecagonal drum turret / 24
Rotary system / Number of driven-tool stations	Individual rotation / 12

Lower turret	
Number of turrets	1
Driven-tool spindle speed	6000min ⁻¹
Drive motor	5.5/3.7kW 24/16N·m
Type of turret head / Number of indexing position	Dodecagonal drum turret / 24
Rotary system / Number of driven-tool stations	Individual rotation / 12

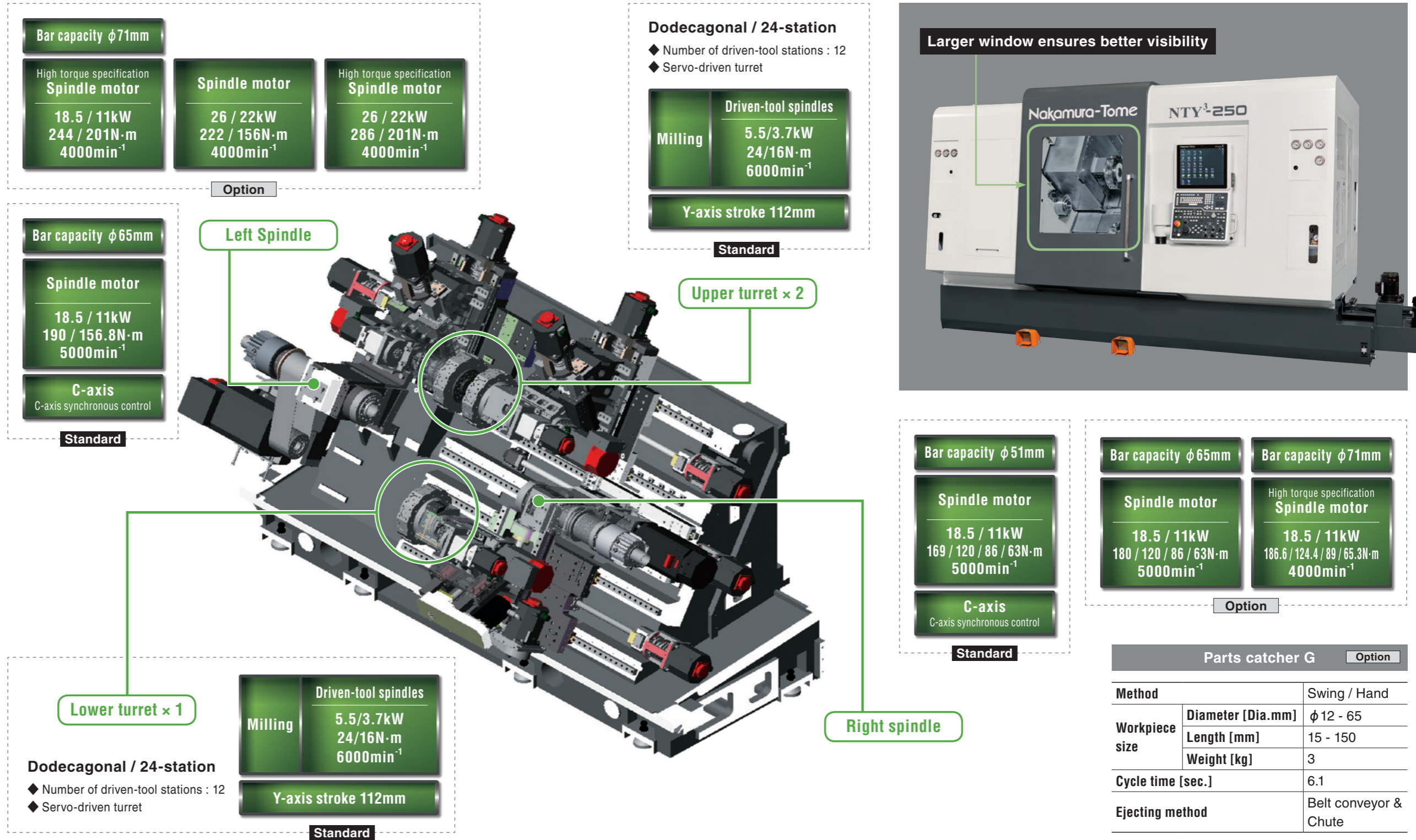
General	
Floor space (L × W × H)	4,900mm × 2,580mm × 2,395mm
Machine weight	14,425kg

72 stations
High-rigidity turret

Upper turrets × 2



Lower turrets × 1



		Parts catcher G	Option
Method	Swing / Hand		
Workpiece size	Diameter [Dia. mm]	ϕ 12 - 65	
	Length [mm]	15 - 150	
	Weight [kg]	3	
Cycle time [sec.]	6.1		
Ejecting method	Belt conveyor & Chute		



NTY³-250

Simultaneous Y-axis machining with the upper and lower turrets on either spindle



Left spindle motor

Right spindle motor

Upper & Lower Milling Motors

18.5 / 11kW

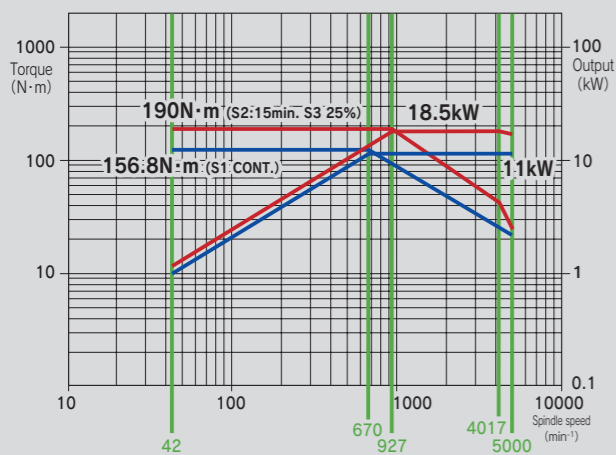
26 / 22kW

18.5 / 11kW

5.5 / 3.7kW

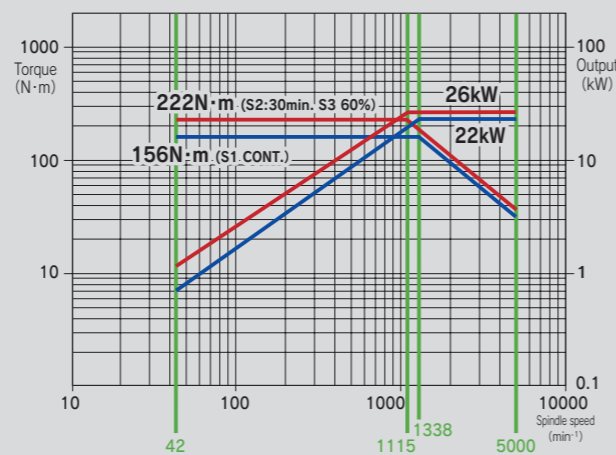
Standard

Spindle speed : 5,000min⁻¹



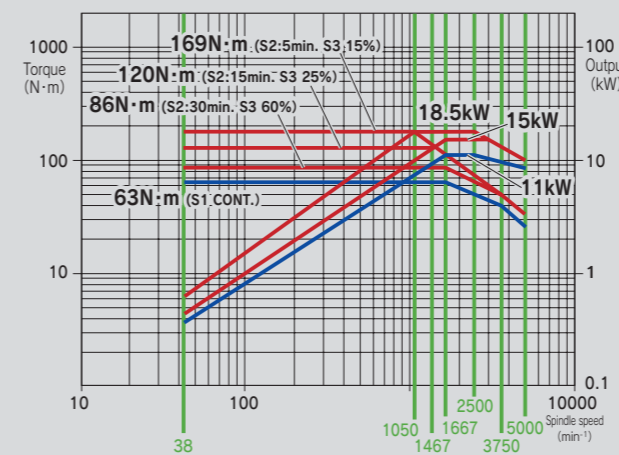
Option

Spindle speed : 5,000min⁻¹



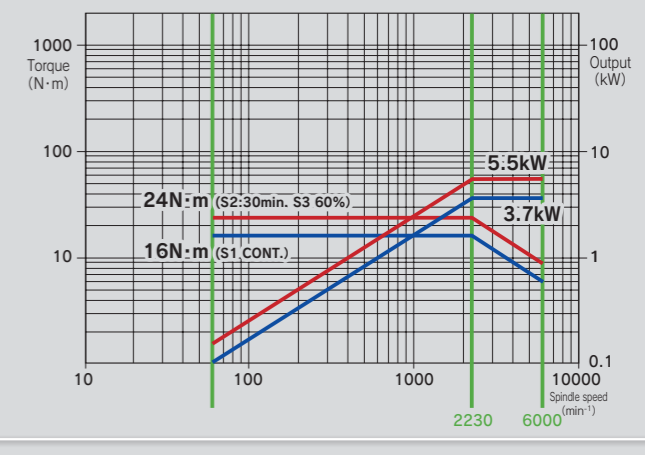
Standard

Spindle speed : 5,000min⁻¹



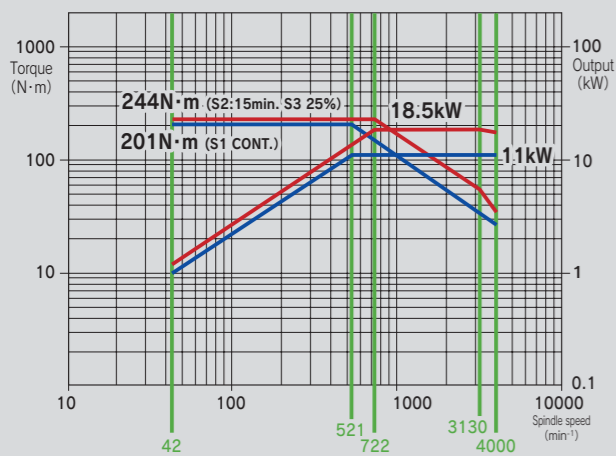
Standard

Driven-tool spindle speed : 6,000min⁻¹



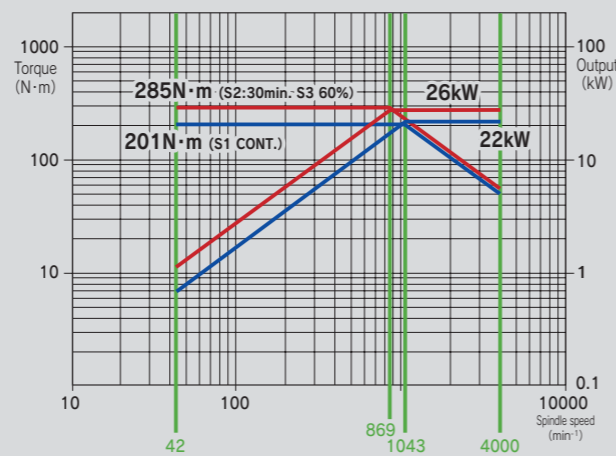
Option High torque specification

Spindle speed : 4,000min⁻¹



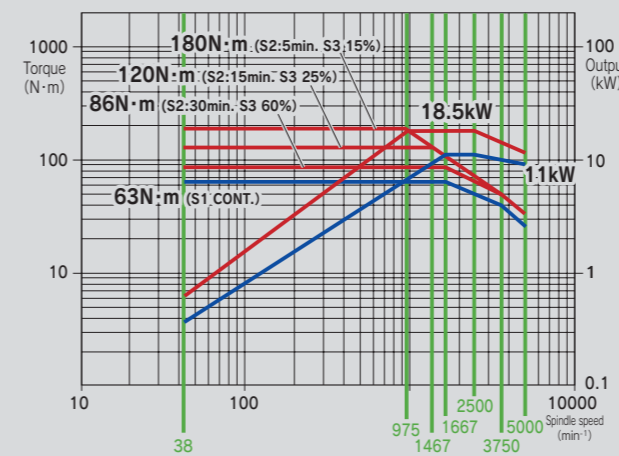
Option High torque specification

Spindle speed : 4,000min⁻¹



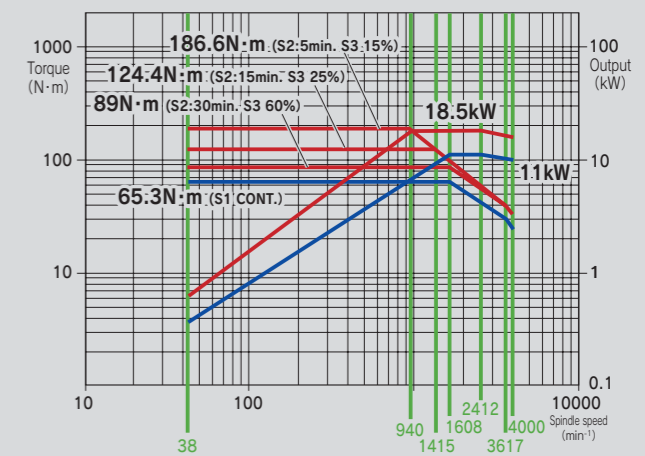
Option

Spindle speed : 5,000min⁻¹



Option High torque specification

Spindle speed : 4,000min⁻¹



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

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



Cut in check

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



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



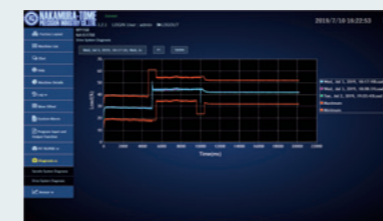
Real Time Monitoring of machine running conditions, in addition to visualizing alarm history and past events.

Data Input / Output

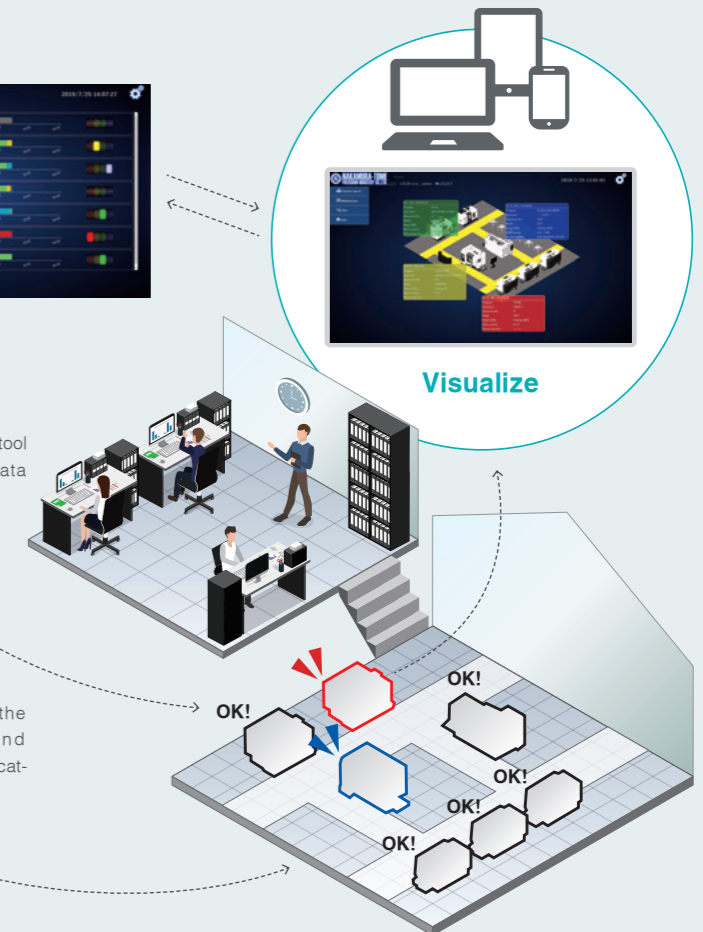


Input and output programs, tool data and other machine data from the monitoring PC.

Diagnosis



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



NT Thermo Navigator AI

Thermal Growth
Compensation using AI.

Compensation model
built using
AI machine learning.

Powered by AI

Time and measured dimension data are input into a dedicated AI Learning software, to build an optimized thermal growth compensation model.

High Precision Thermal Growth Compensation

The compensation value is calculated from acquired data. The more data is input, the more accurate is the compensation value.

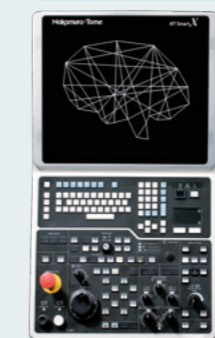
— Pre-correction thermal displacement data
— Thermal displacement data after correction

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

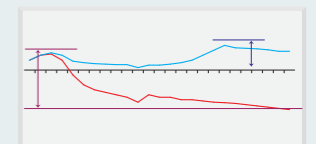


Acquired Data
analyzed with
NT Thermo Navi AI

Feedback



Standard for NT Smart X



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.



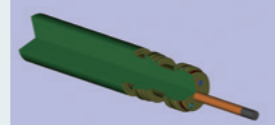
By checking in advance the chuck and the tool, the tool and the cover, etc. and checking the machining process etc., the risk of a machine collision when actually moving the machine can be reduced.

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

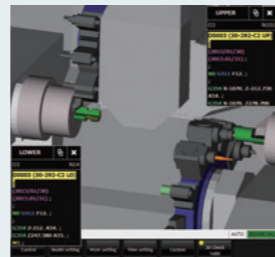
It can override the settings for fast feed and cutting feed individually. Simulation by process, single feed is possible.

By process
Single feed

Image shown here is of a 2-turret machine



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!



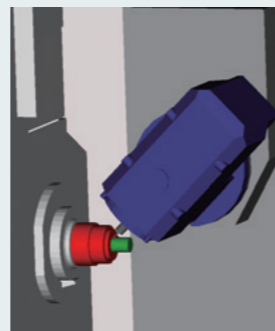
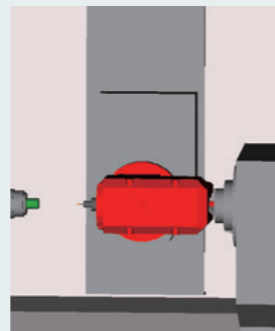
Available in automatic mode or in manual mode. Using registered 3D models of machine, chucks, tools, holders and parts, machine collisions can be monitored and prevented in real time during automatic, manual or jog movements.

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.

Image shown here is of a Tool spindle machine



Airbag (Overload detection)

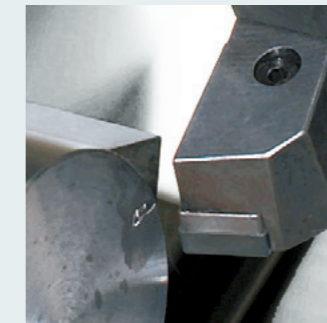
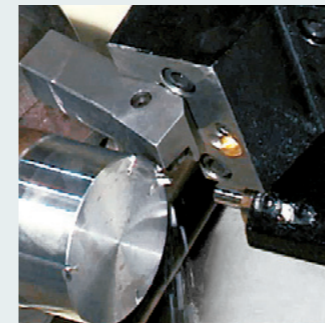
Compared to other machines, Nakamura-Tome machine will not break after the slightest collision. The "Airbag Function" minimizes the damage that may occur during a collision.

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. Nakamura-Tome is...

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.

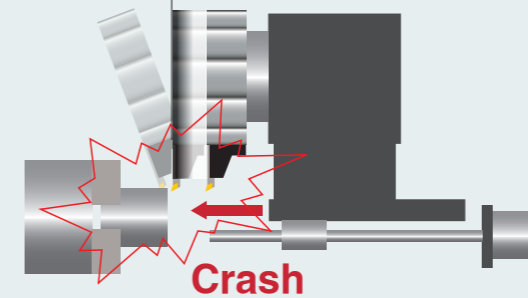
With Airbag

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

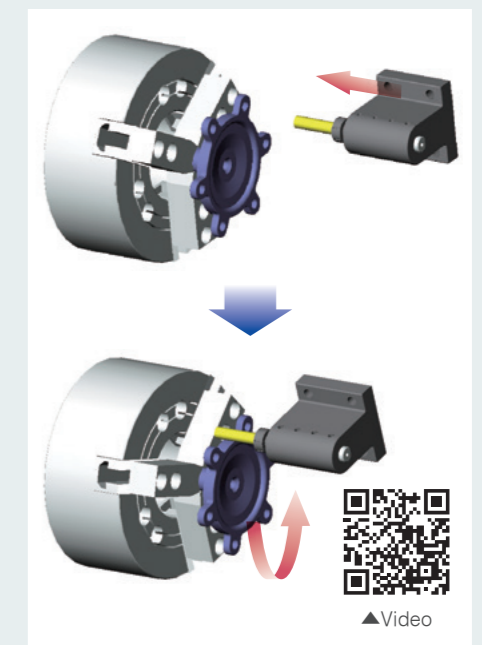
X Y Z B C

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.

Advanced NT Work Navigator !

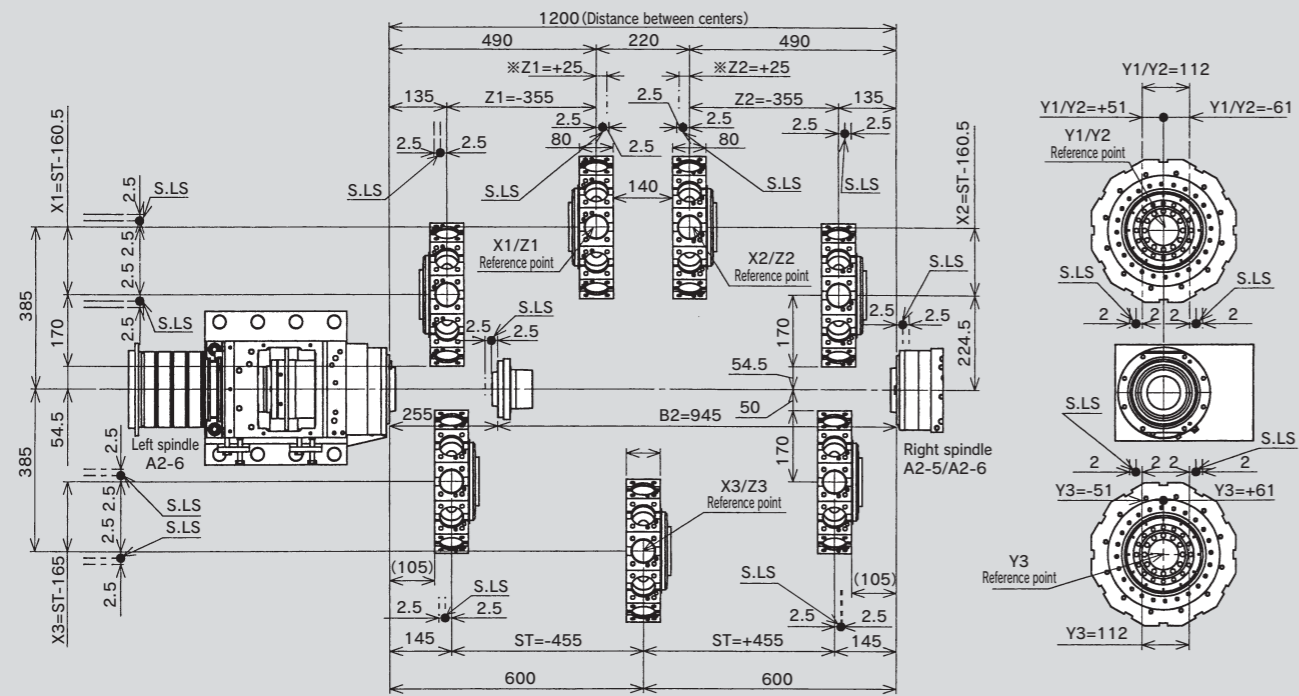
No fixtures required

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.



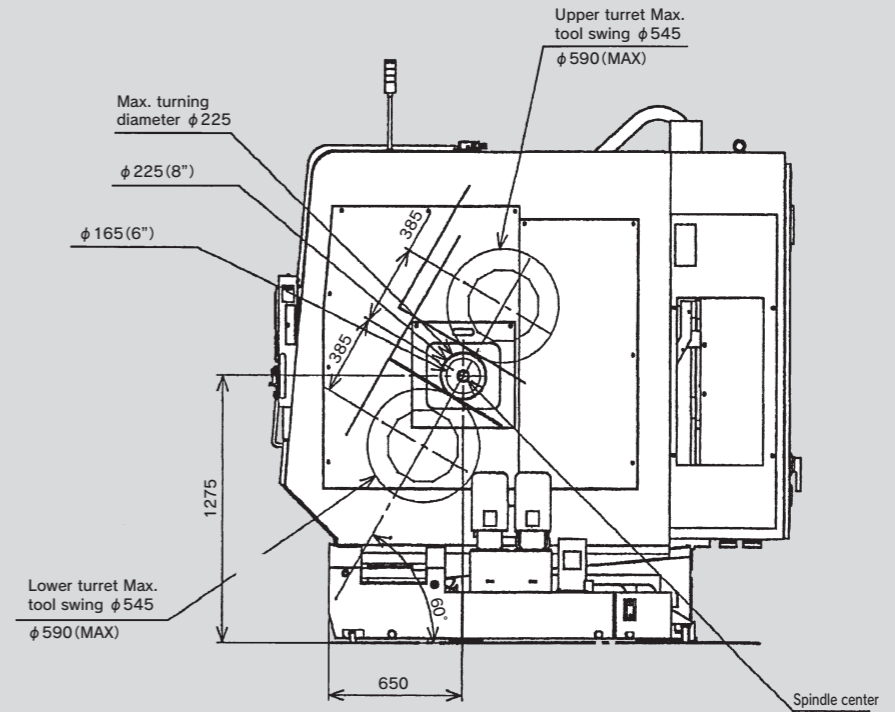
▲Video

Slide Travel Range



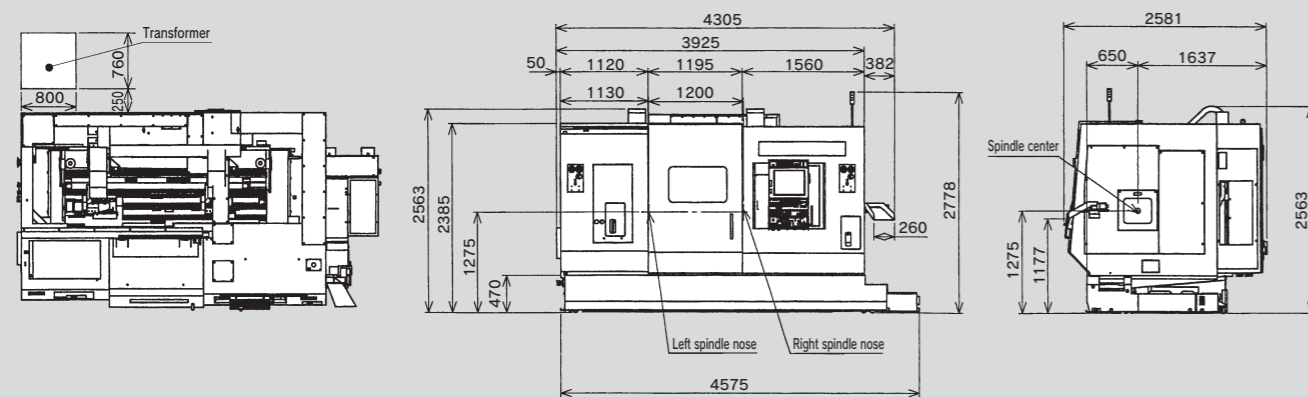
*Both Turrets can not be moved +direction from its home position

Maximum Tool Diameter



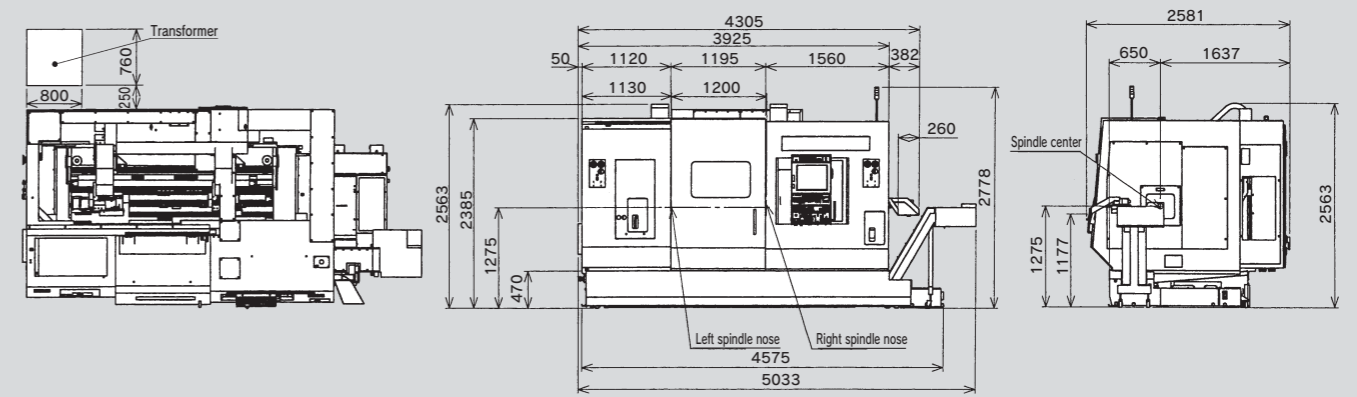
Machine Dimensions

Parts catcher G type



Machine Dimensions

Chip conveyor right side outlet type



NTY³ (3T 3Y 3M) Series

Super NTY³



NTY³ 250



Super NTY³ Jumbo



$\phi 42$

6"

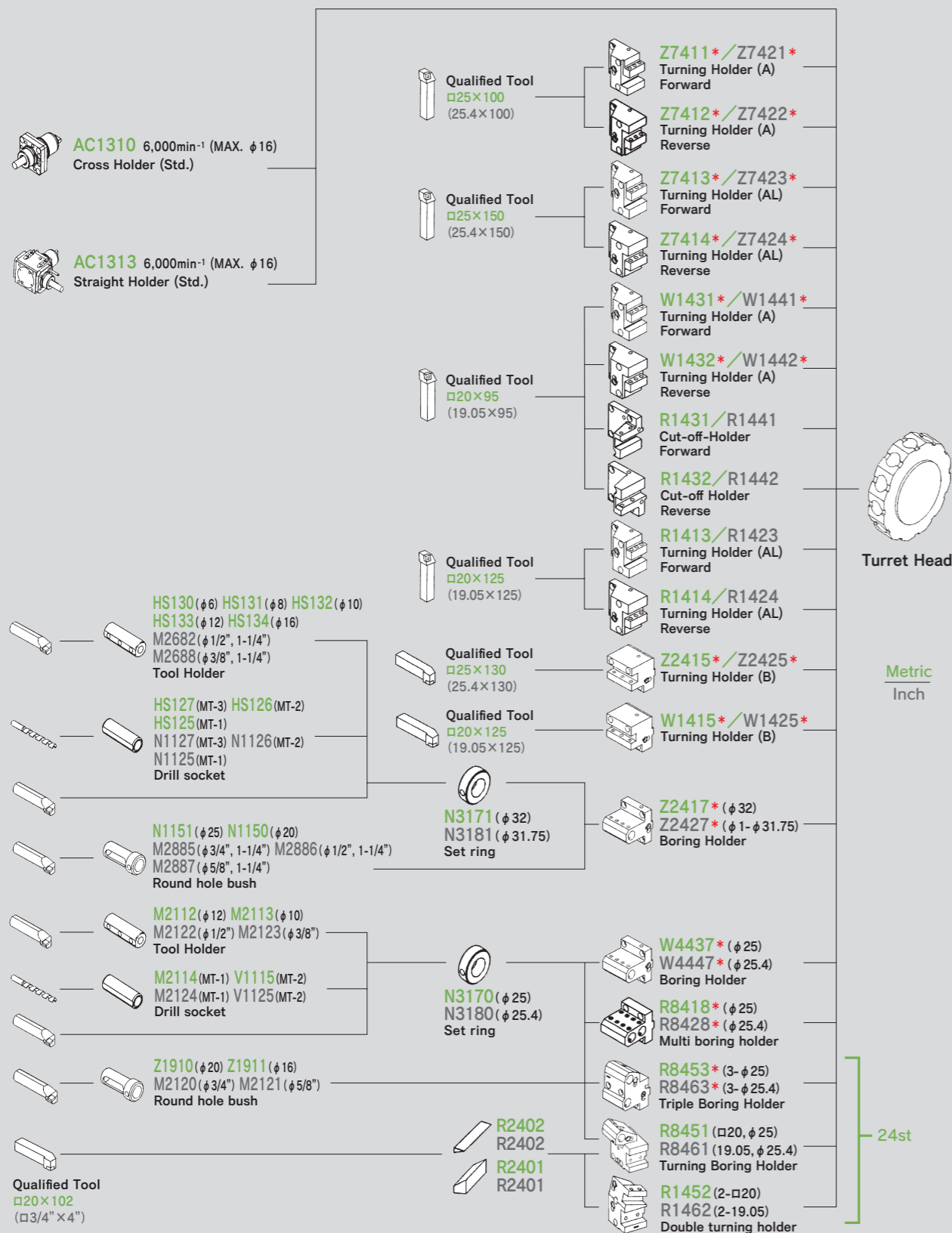
Standard Bar capacity

Standard Chuck size

$\phi 80$

10"

Tooling System Diagram



For * Marked tools, coolant comes out from the tool holders on both sides, when cutting on either left or right side spindle.
As for other tool holders, additional coolant piping mounted on holders or turret face is necessary.

Machine Specification

Capacity	
Max. turning diameter	225mm
Standard turning diameter	150mm
Distance between centers	max.1200mm / min.255mm
Max. turning length	310.5 / 905.5mm
Bar capacity	51mm 65mm 71mm (op.)
Chuck size	210mm (8") / 165mm (6")
Axis travel	
Slide travel (X1 / X2 / X3)	160.5mm / 160.5mm / 165mm
Slide travel (Z1 / Z2 / Z3)	355mm / 355mm / 910mm
Slide travel (Y)	-61, +51mm / -61, +51mm / -51, +61mm
Slide travel (B2-axis)	945mm
Rapid feed X1 / X2 / X3	30m/min
Rapid feed Z1 / Z2 / Z3	40m/min
Rapid feed B axis	40m/min
Rapid feed Y1 / Y2 / Y3	14m/min
Left spindle	
Spindle speed range	Stepless
Spindle nose	- A2-6 A2-6 (op.)
Hole through spindle	- 80mm 80mm
I.D. of front bearing	- 110mm 110mm
Hole through draw tube	- 66mm 72mm
Right spindle	
Spindle speed range	Stepless
Spindle nose	A2-5 A2-6 (op.) A2-6 (op.)
Hole through spindle	63mm 80mm 80mm
I.D. of front bearing	90mm 110mm 110mm
Hole through draw tube	52mm 66mm 72mm
C-axis	
Least input increment	0.001°
Least command increment	0.001°
Rapid index speed	600min ⁻¹
Cutting feed rate	1 - 8000°/min
C-axis clamp	Disk clamp
C-axis connecting time	1.5sec.
Upper & Lower turrets	
Number of turrets	3
Type of turret head	Dodecagonal drum turret
Number of tool stations	12 station
Number of index positions	24
Tool size (square shank)	□ 25mm
Tool size (round shank)	φ 32mm
Rotating tool	
Rotary system	Individual rotation
Spindle speed	6000min ⁻¹
Spindle speed range	Stepless
Number of rotation tool station	12 × 3
Tool shank	Straight holder φ 1mm - φ 16mm
Cross holder	φ 1mm - φ 16mm
Drive motor	
L-spindle motor torque / Spindle speed	
Standard	18.5/11kW - 190/156.8N·m / 5,000min ⁻¹
High torque specification	244/201N·m / 4,000min ⁻¹
Option	26/22kW - 222/156N·m / 5,000min ⁻¹
High torque specification	285/201N·m / 4,000min ⁻¹
R-spindle motor torque / Spindle speed	
Standard	169/120/86/63N·m / 5,000min ⁻¹
Option	18.5/11kW - 180/120/86/63N·m / 5,000min ⁻¹
High torque specification	- 186.6/124.4/89/65.3N·m / 4,000min ⁻¹
Driven tools	5.5/3.7kW 24/16N·m
General	
Machine height	2395mm
Floor space	4900mm × 2580mm
Floor space	5350mm × 3350mm (Including chip conveyor)
Machine weight	14425kg
Power requirements	
power supply	137kVA
Air supply	500NL/min
Machining support	
Rigid tapping	Standard
Spindle synchronization	Standard
C-axis synchronization	Standard
Spindle orientation	Standard

● 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 Specification

Items	
Control type	FANUC 31i-B 3-PATH
Controlled axes	
Controlled axes	13axes
Simultaneously controlled axes	4axes (Upper L / X1, Z1, C1, Y1) + 4axes (Upper R / X2, Z2, C2, Y2) +5axes (Lower X3, Z3, C3 (C1, C2), Y3, B2)
Input command	
Least input increment	0.001mm / 0.0001in (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 / ±39370.0787in, ±999999.999°
Absolute / incremental programming	X, Z, Y, C, B2 (absolute only for B2) / U, W, V, H
Decimal input	Standard
Inch / Metric conversion	G20 / G21
Programmable data input	G10
Feed function	
Cutting feed	feed / min X : 1-8000mm/min, 0.01 - 315inch/min Z : 1-8000mm/min, 0.01 - 315inch/min C : 1-4800degree/min Y : 1-8000mm/min, 0.01 - 315inch/min B2 : 1-8000mm/min, 0.01 - 315inch/min feed / rev 0.0001mm/rev - 8000mm/min 0.000001 - 50.000000inch/rev
Dwell	G04
Feed per minute / Feed per revolution	G98 / G99
Thread cutting	G32
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
Program memory	
Part program storage length	1280m
Part program editing	delete, insert, change
Program number search	Standard
Sequence number search	Standard
Address search	Standard
Number of registerable programs	1000programs
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
Operation and display	
Operation panel : Display	19" color SXGA LCD touch panel
: keyboard	QWERTY keyboard
Program support	
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 re-composition	Standard (used for C axis control from Lower)
Sub program	Standard
Balance cut	G68, G69
Custom macro	Standard
Addition to custom macro common variables	Standard (After addition, #100-#199, #500-#999)
Luck-bei II / NT Manual Guide i	Standard
Abnormal load detection function	Standard
NT Work Navigator (torque type)	Standard (not including contact bar)
NT NURSE	Standard
NT Collision Guard	Standard
NT-IPS	
O/S	Windows XP Embedded
Pointing device	Touch pad



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