

NTY³-250

NAKAMURA-TOME
PRECISION INDUSTRY CO.,LTD.

New Model Added to the

The Latest High Productivity Three-Turret Multitasking Machine

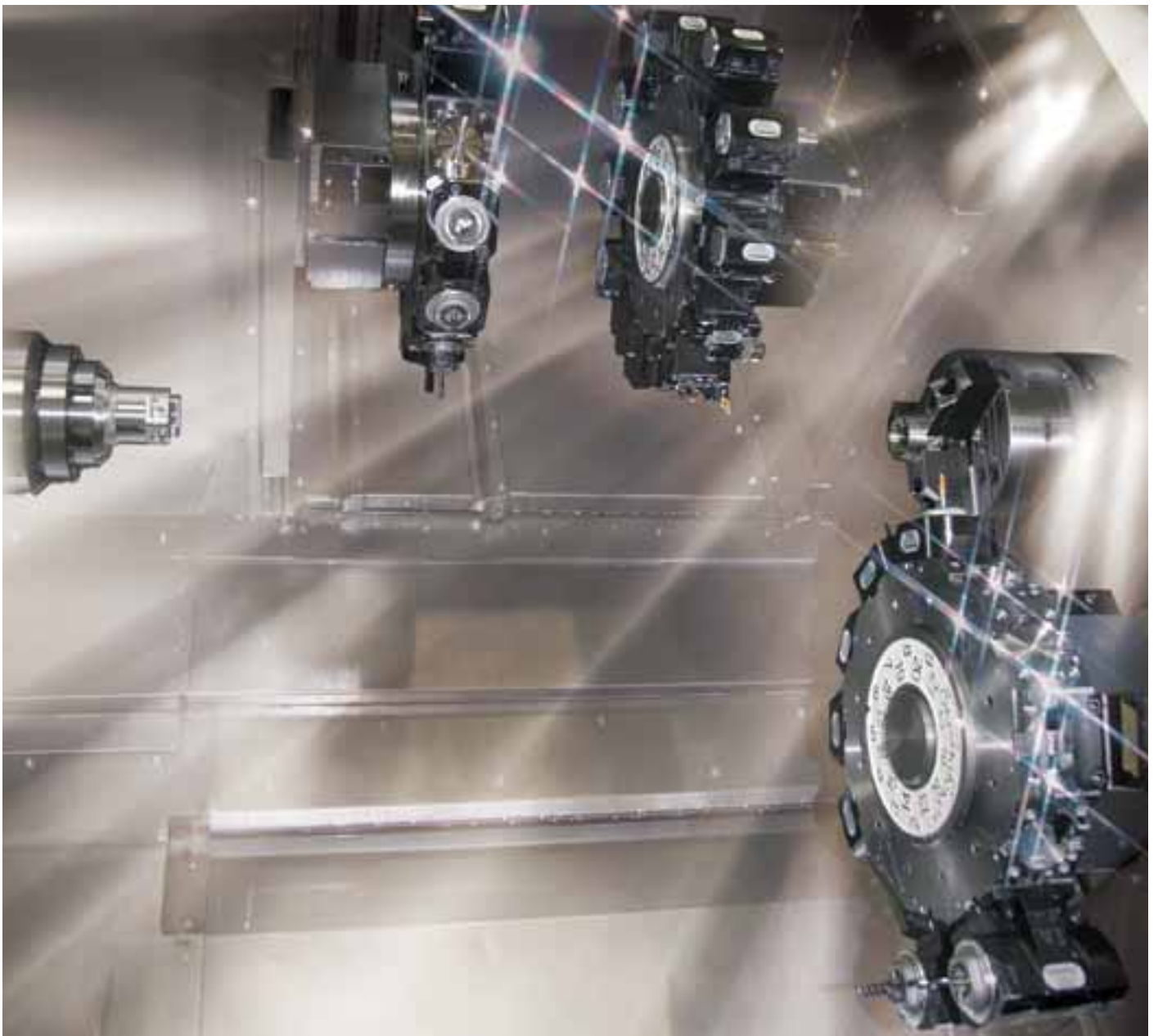


NTY³ Series





3 TURRETS WITH EQUAL PERFORMANCE & CAPABILITIES



NTY³-250

This **3** turret machine with high-rigidity structure and slides

19" Color LCD
Touch Panel

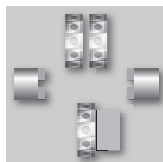
NT-IPS

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



features astounding capabilities in both turning and milling.

NTY³-250



Capacity	51mm	65mm	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	-
Option		5000min ⁻¹	-
High torque specification		-	180 / 120 / 86 / 63N·m / 5000min ⁻¹
		-	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



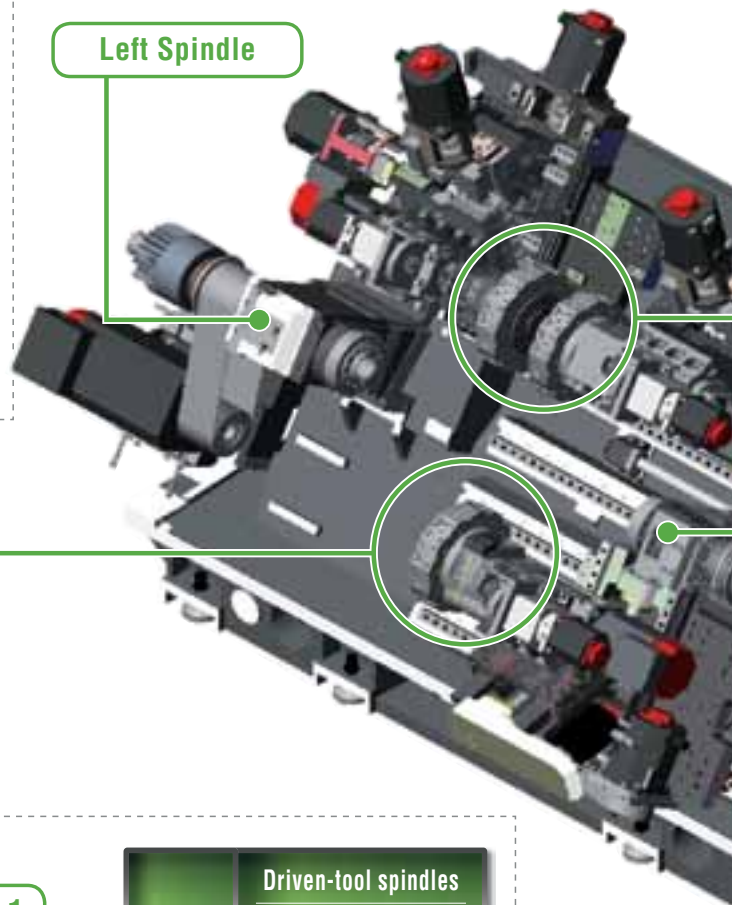
Lower turrets × 1

Bar capacity 71mm		
High torque specification Spindle motor	Spindle motor	High torque specification Spindle motor
18.5 / 11kW 244 / 201N·m 4000min ⁻¹	26 / 22kW 222 / 156N·m 4000min ⁻¹	26 / 22kW 286 / 201N·m 4000min ⁻¹

Option

Bar capacity 65mm
Spindle motor
18.5 / 11kW 190 / 156.8N·m 5000min ⁻¹
C-axis C-axis synchronous control

Standard



Lower turret × 1	
Dodecagonal / 24-station	Driven-tool spindles
Number of driven-tool stations : 12	Milling 5.5/3.7kW 24/16N·m 6000min ⁻¹
Servo-driven turret	Y-axis stroke 112mm

Standard

Stable Accuracy Ensured

Dodecagonal / 24-station

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

Milling	Driven-tool spindles
	5.5/3.7kW 24/16N·m 6000min ⁻¹
	Y-axis stroke 112mm

Standard

Upper turret × 2



Right spindle

Larger window ensures better visibility



Bar capacity 51mm

Spindle motor

18.5 / 11kW
169 / 120 / 86 / 63N·m
5000min⁻¹

C-axis

C-axis synchronous control

Standard

Bar capacity 65mm

Spindle motor

18.5 / 11kW
180 / 120 / 86 / 63N·m
5000min⁻¹

Bar capacity 71mm

High torque specification
Spindle motor

18.5 / 11kW
186.6 / 124.4 / 89 / 65.3N·m
4000min⁻¹

Option

Parts catcher G

Option

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



NTY³-250

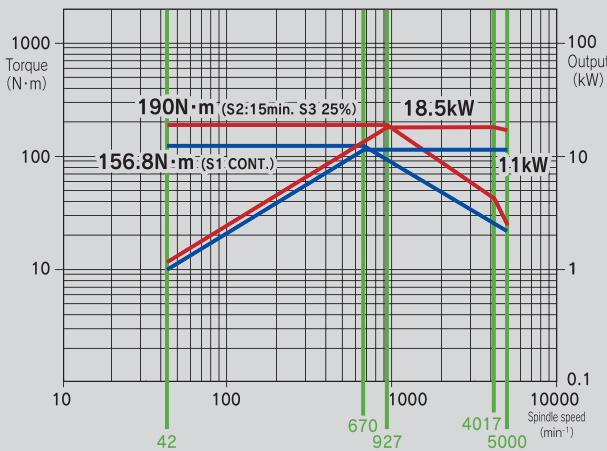
Simultaneous Y-axis machining with the upper and lower turrets on either spindle

Left spindle motor

18.5 / 11kW

Standard

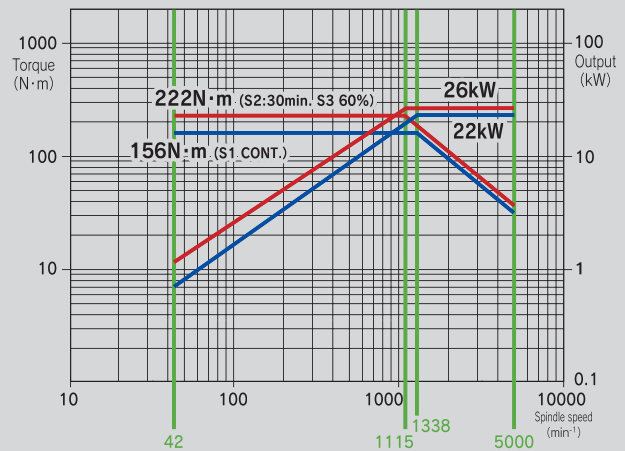
Spindle speed : 5,000min⁻¹



26 / 22kW

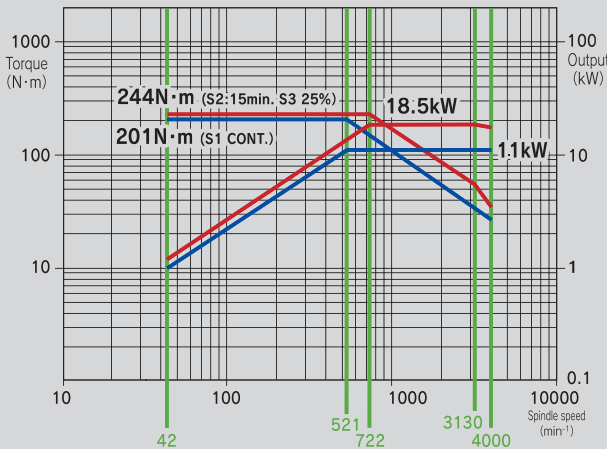
Option

Spindle speed : 5,000min⁻¹



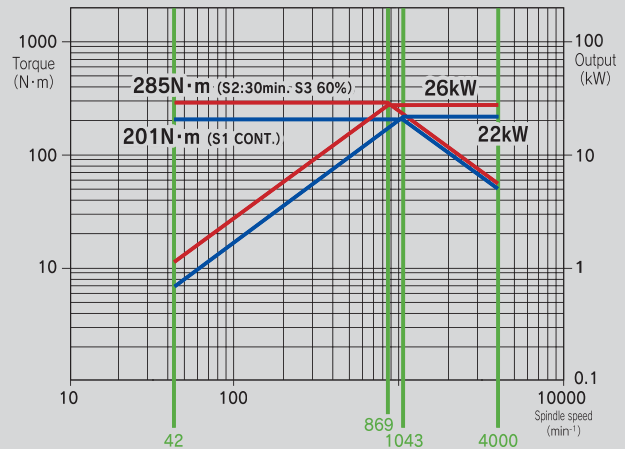
Option High torque specification

Spindle speed : 4,000min⁻¹



Option High torque specification

Spindle speed : 4,000min⁻¹



Milling

Faster Cycle Time
From diversified small-lot production to mass production

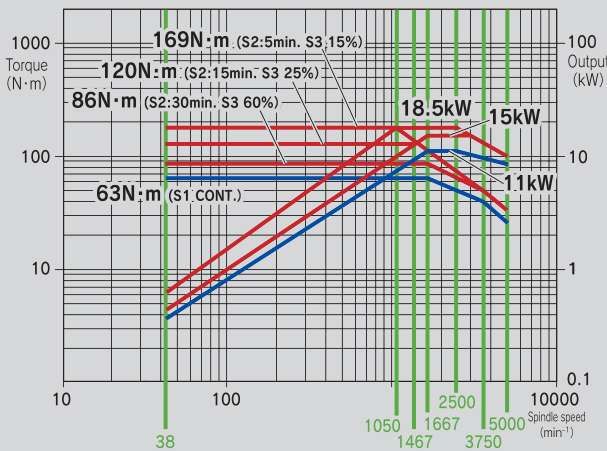


Right spindle motor

18.5 / 11kW

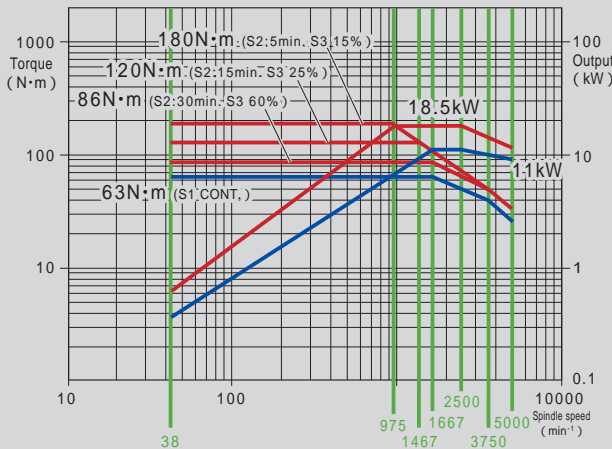
Standard

Spindle speed : 5,000min⁻¹



Option

Spindle speed : 5,000min⁻¹

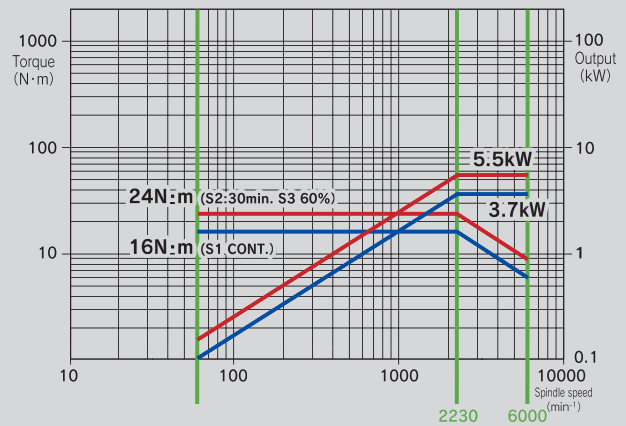


Upper & Lower Milling Motors

5.5 / 3.7kW

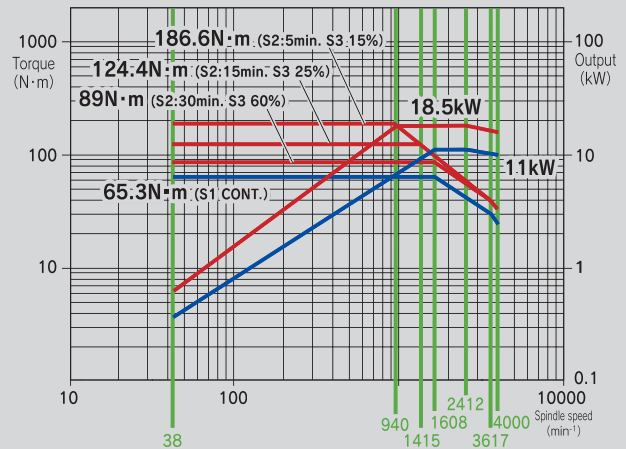
Standard

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



Option High torque specification

Spindle speed : 4,000min⁻¹



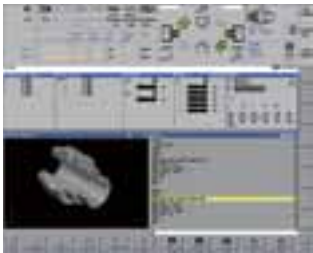
Largest Display : 19" Touch Panel

- NT NURSE
- LUCK-BEI II
- AIRBAG
- NT Work Navigator
- NT Collision Guard
- Manual Handle Retrace

(option)

19" Color LCD Monitor

With the user in mind, a large high-resolution (19" SXGA 1280x1024) color LCD is introduced. Nakamura-Tome's original screens are featured on a large CNC display unit. Switch between machine status screen and load graph screen by pressing a single button, or return to the previous NT screen by simply pressing the NT screen button.



● STATUS DISPLAY



● LOAD GRAPH

Open CNC

Several original screens developed by Nakamura-Tome, such as Tool Setting Screen and Work-piece Status Screen, are featured on this machine to ensure ease of set up and ease of operation with loading / unloading devices.



● CNC SCREEN



● PROG CHECK



● NT SETTING



● TOOL SETTING



Program storage length	1280mm	2560mm	5120mm	10240mm	20480mm
Program registered number	1000	1000 or 2000	1000 or 4000		
Tool offset pairs	99 + 99 + 99				
			Standard	Option	

Full operator support for more ease of use and reliability

Illuminated Switches

LED light switches are introduced on the operation panel. When machine power is on, a backlight makes it possible to see the switch even in a dark condition. When pressed, the switch is fully illuminated. When the spindle, tool spindle or feed override rotary switches are set to 100%, the lit LED switches enable the operator to see the override condition from a distance.



Spindle override switch

Feed-rate override switch

NT-Original screen

Setting and operation integrated in one screen

Switches on the control panel, NT-setting screen commands and other buttons were all put together in one screen. All setting operations can be done from within one screen, which is displayed by pushing one button, ensuring easy operation.



● NT SETTING

All required information displayed on one screen

Set up can be easily performed without changing screens. Graphic displays of working-area units, such as chucks, parts, tool spindle, ...etc, are great visual aids to ensure ease of understanding.



● TOOL SETTING

Coolant setting screen

Coolant setting screen pops up by pushing one button on the control panel. Easy to see! Easy to use!



● TOOL INFORMATION

Coordinate and tool setting integrated in one Screen

Geometry & wear offsets, work coordinates and Manual Guide i tool information were all put together in one screen. Easy to see! Easy to use!



Pop up display

By pressing the AUX key, registered screens subsequently pop up, showing machine conditions on several screens. Thanks to the NTIPS large screen, it became possible to look at the NC program while watching 3D interference check, or to look at the CNC coordinates while watching the machining area through a video camera, ... etc. Easy to see! Easy to understand! Easy to use!



Monitoring System (op.)

It is possible to mount an external CCD camera inside the machine. Using the screen controller, the video camera can be panned, tilted or zoomed. Additionally, it is possible to pre-register up to 6 camera positions, which can be quickly recalled later by simply pressing the "AUX" key. Full screen display is also available by pressing the provided " " button, similar to several Windows applications.



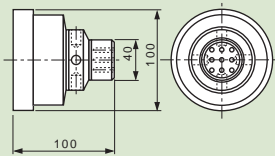
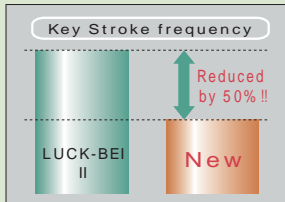
Featuring new functions!

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 moved 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.



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 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.



By selecting the material, cutting conditions are automatically input.



By setting the surface roughness, machining conditions are automatically input



Cutting conditions. End mill

Process Editing

A function that automatically recognizes and extracts the name and order of all machining processes, then displays them in table layout. Machining processes can be moved, copied or swapped easily. In addition, waiting M-codes can be added with the click of a button.



Waiting function is easily input with the push of a button

Fixed Forms

Generous fixed forms with over 600 patterns (10 times more than before) are standard.

Fixed forms are easily selected from a menu.

Additional custom made programs can be registered.



Machining Cycle (conversational) Function

In addition to Nakamura-Tome's original NT Work Navigator, which is essential for multitasking, "soft quill pusher" and other NT-Nurse functions can be programmed easily.



Work navigator programming screen



Soft work pusher programming screen

Advanced NT Nurse

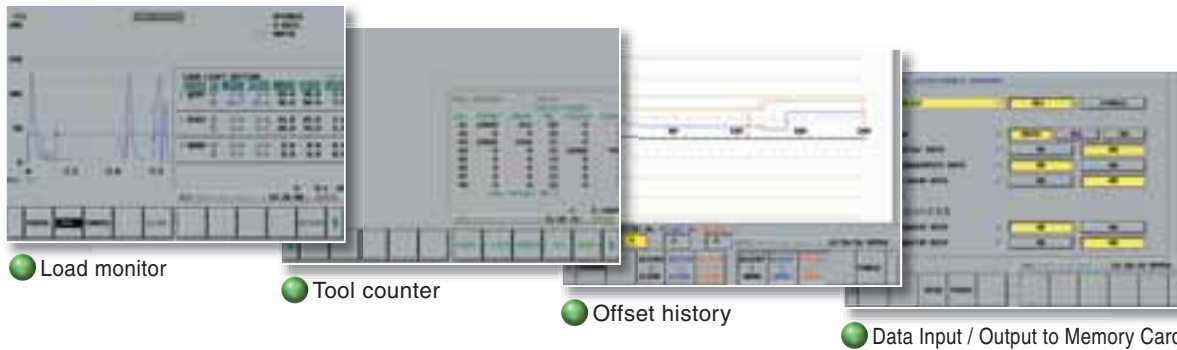
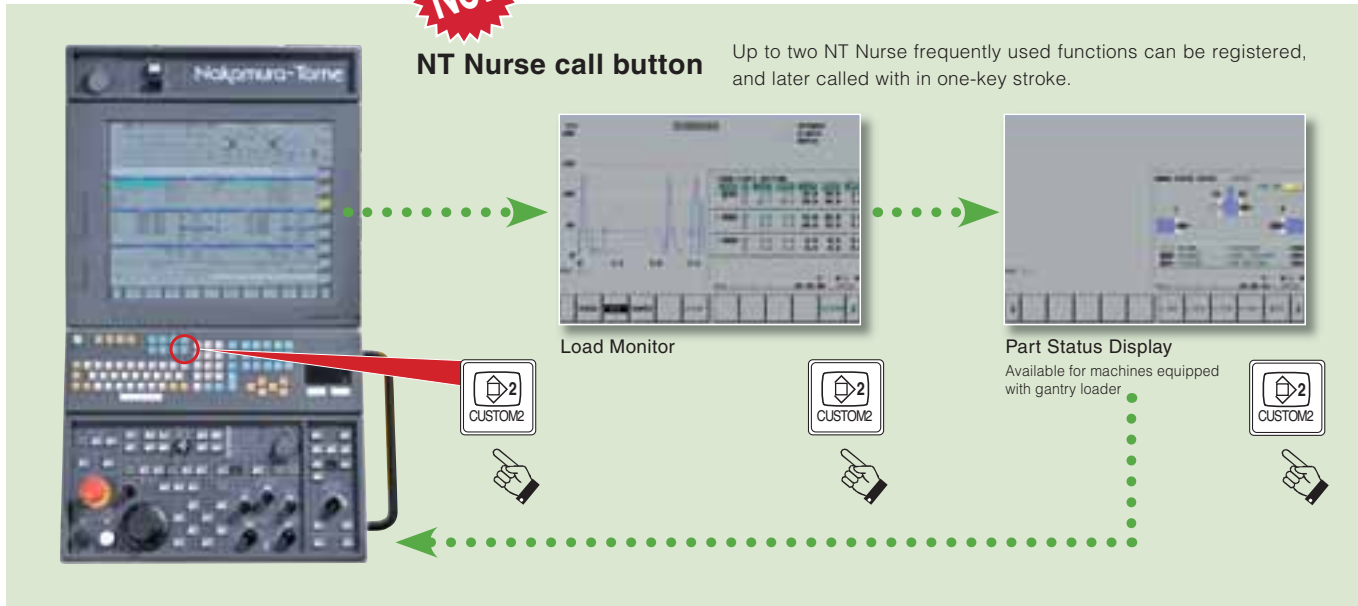
-Generous User-friendly Support System-



Full operator support for more ease of use and reliability

For Increased Productivity!

"NT Nurse" which is standard on all machines, has a new function called "Screen registration". NT Nurse Functions that are frequently used can be registered, and later called up with one-key stroke. More than 34 NT Nurse functions are available to support improving your productivity.



Program data, tool offsets, coordinate offsets, NT-Nurse data and all other part related-data, can be easily transferred to one single folder on the memory card with one single stroke, making machining data for one single part easy to manage and to recall. A memory card is required for data input/output.

Dual safety

NT Collision Guard

+

Airbag

Double safety features

NT Collision Guard

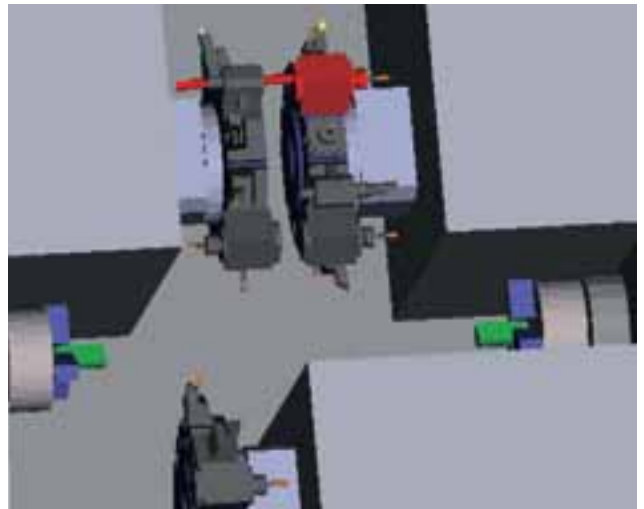
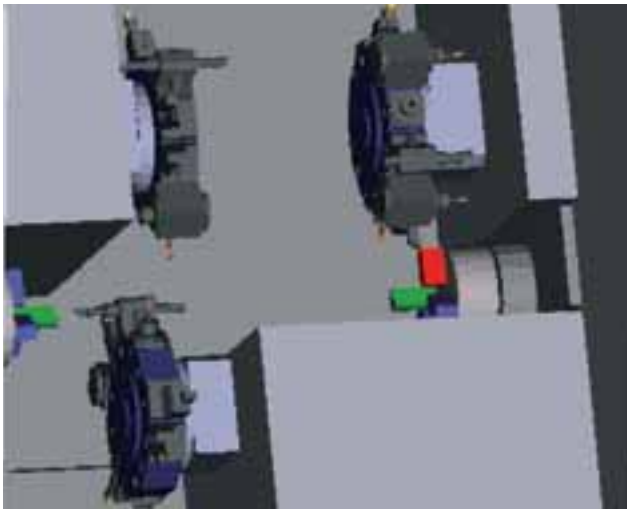
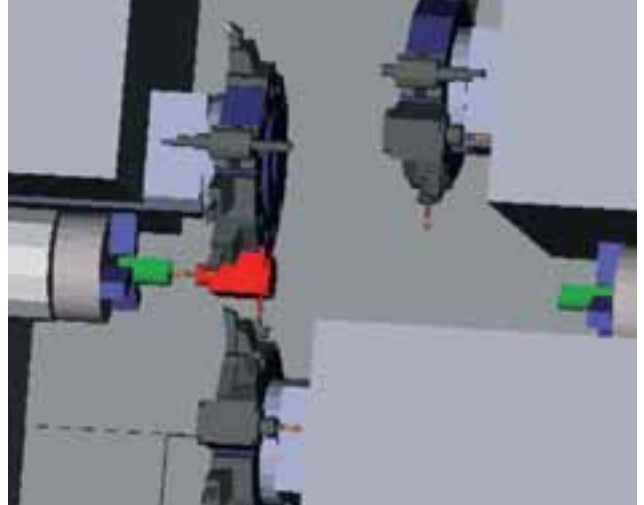
ACTIVE SAFETY

New

Preventive safety technology – Machine collisions are avoidable!

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

If interference is detected, the machine stops with the affected area highlighted in red on the CNC display.



Jig less! Set-up less! Skill less!

This essential function for multitasking machines is standard.

Safety Technology.

"Program and setup is difficult...." "If the machine stops during the process...." "Costly jigs and fixtures for Complex parts...." You may have similar production concerns. Having the NT Nurse system, NT Work Navigator and Overload detection, reduces manufacturing headaches and provides precious production support.

NT Work Navigator

ACTIVESAFETY

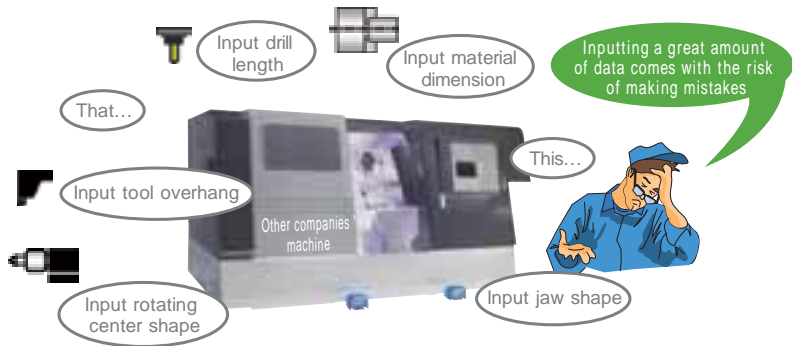
X Y Z B C

- Advanced NT Work Navigator !
- No fixtures required

for maximum machine protection

Full operator support for more ease of use and reliability

Airbag (Overload detection) PASSIVE SAFETY

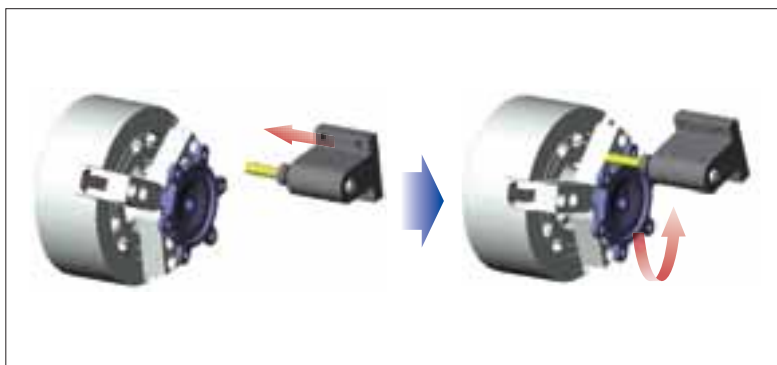
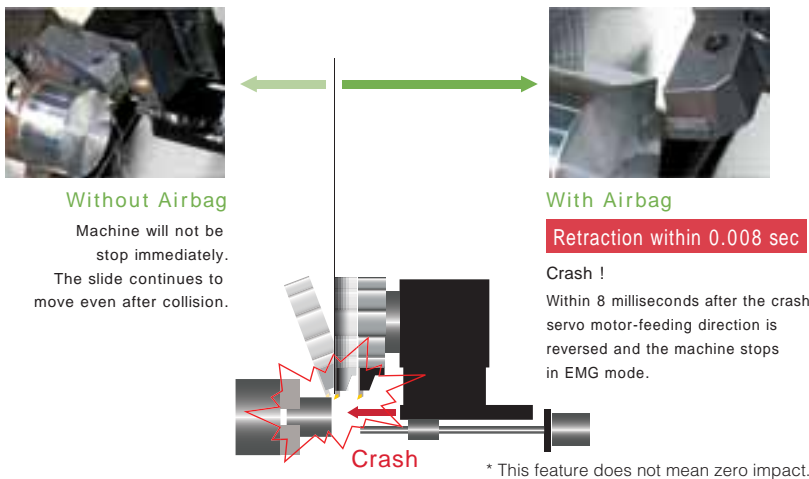


Even with barrier function, machine collisions may occur

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.

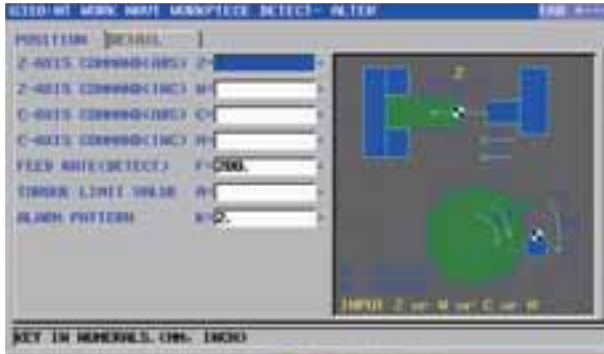
All Nakamura-Tome machines are equipped with a safety feature called "airbag" (overload detection), which will greatly reduce the impact force and prevent heavy damage to the machine.



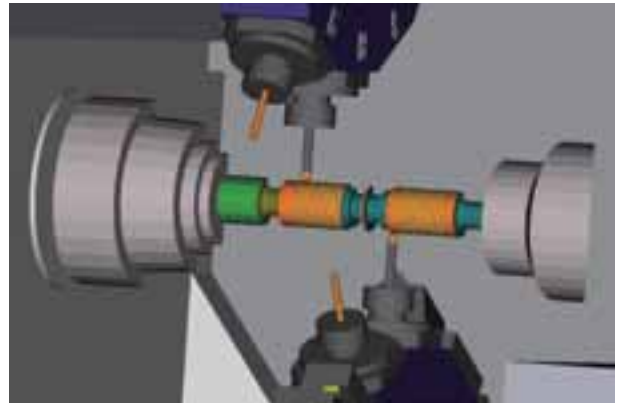
- Air Cutting Mode
- Index Speed override
Machine set-up essentials
- Jump Programming (G411)
Continuous-machining essentials
- Axis Torque Limit Function (G359)
- Cut-in Check
- Program Resume
- Manual Handle Retrace (op.)

NT Multitasking Office New

Conversational programming



Simulation

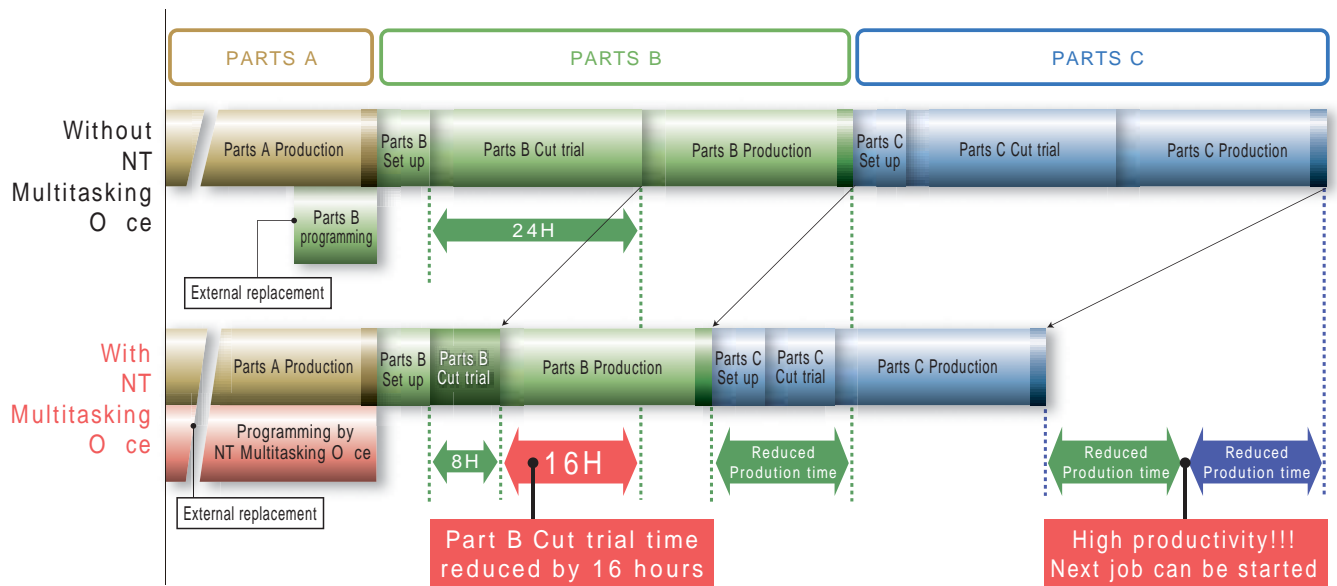


- Programming
- Work piece machining simulation
- Collision
- Automatic cutting-condition setting function
- Preparation support
- Easy operation
- Machine simulation
- Cycletime check

What is “NT Multitasking Office” ??

Without leaving the office, you can make a program, then check how it will function on the machine and even optimize it. This leads to a substantial reduction of machine set up time, and increases safety and efficiency, thus contributing to higher productivity.

Effect of NT Multitasking Office

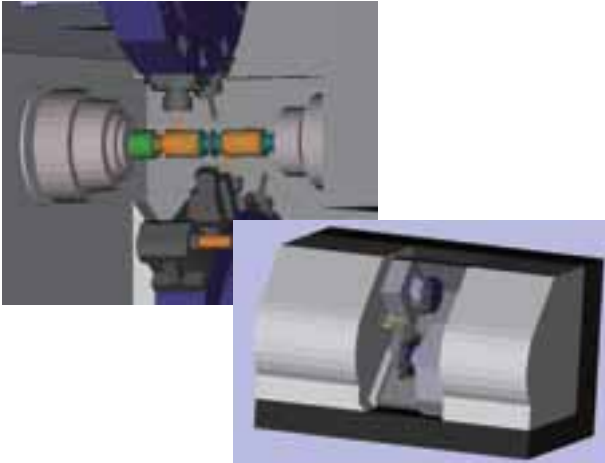


Tool setting display

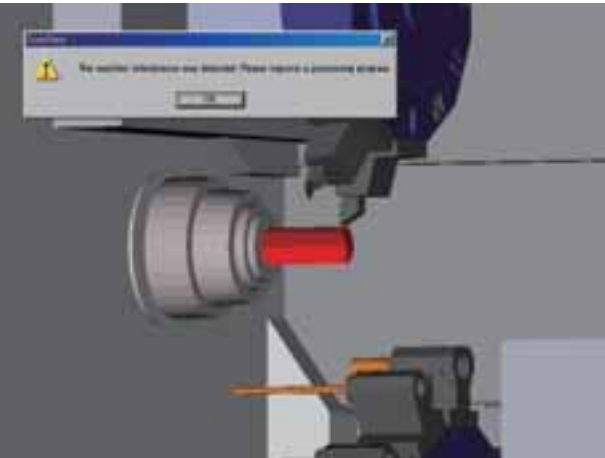
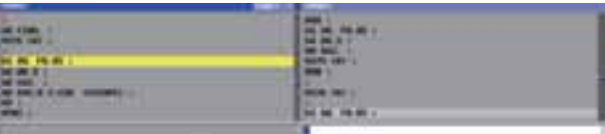


Standard tools and cutting holders are already registered, and just need to be selected

Simulation display



Collision check



Interference position could be recognized by vision with red color and axis information. Program line is also easy to confirm.

Other function

Cycle time display

Cycle time can be checked, and program can be modified before machining

Interface between machine and simulation software

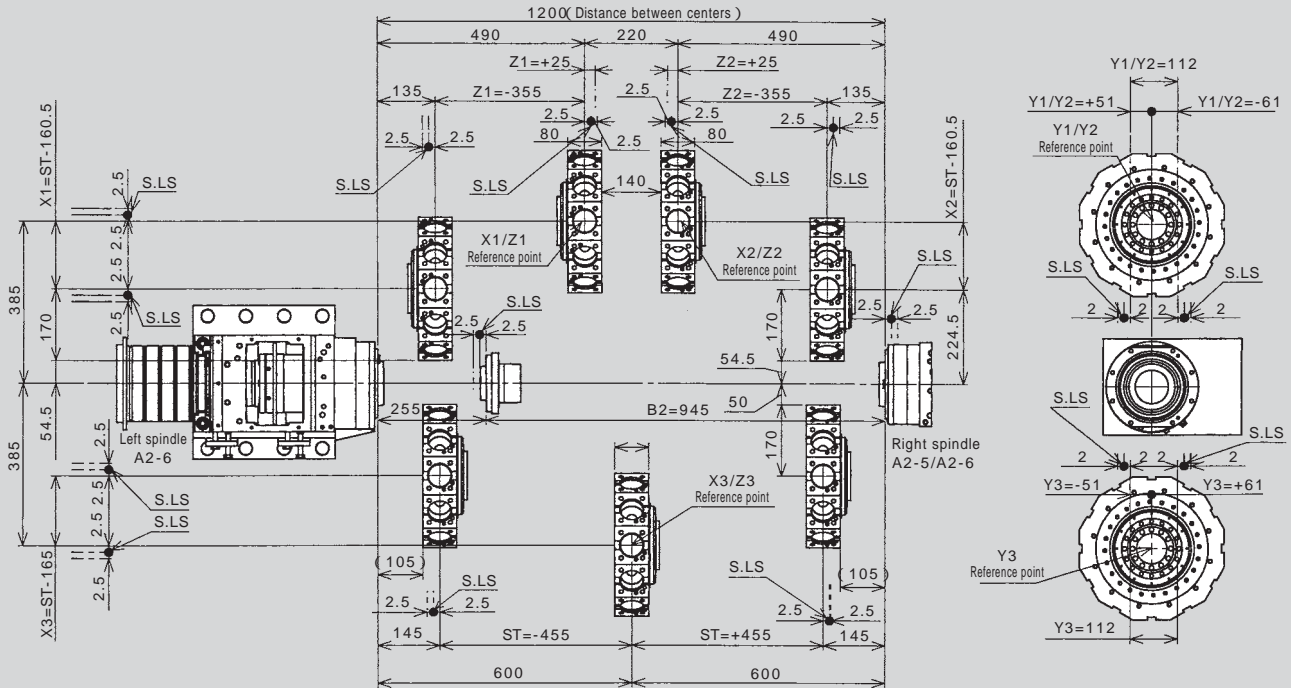
Perfect interference check can be done with the interface between machine and software.

Preparation support

Data of many types of standard tools is already registered.

Note: Multitasking office is available as an option.

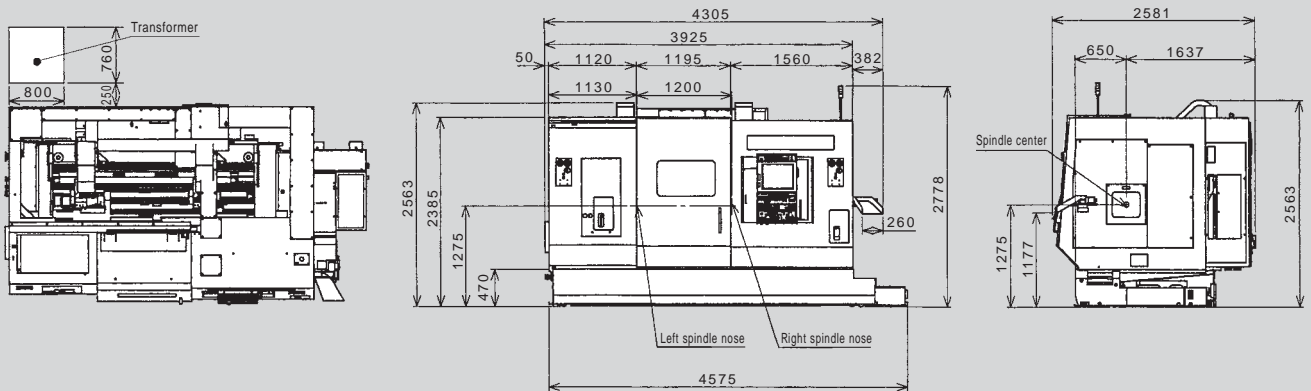
Slide Travel Range



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

Machine Dimensions

Parts catcher G type



NTY³ (3T 3Y 3M) Series

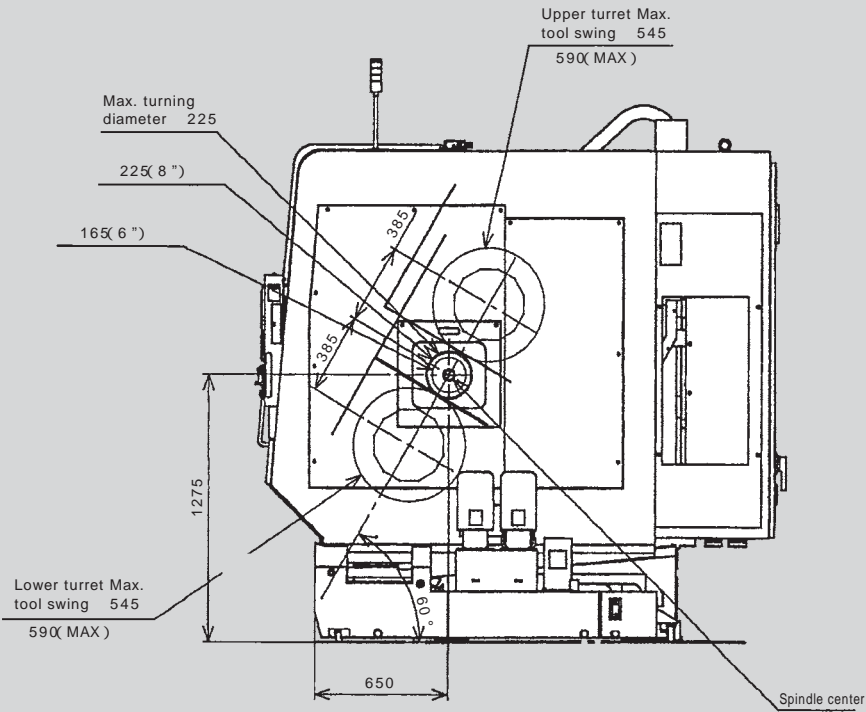
Super NTY³



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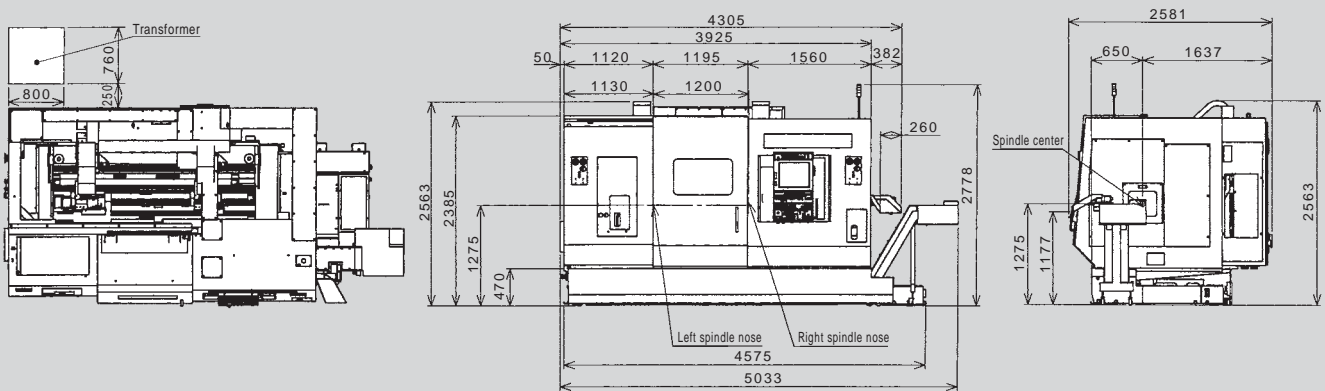
6"

Maximum Tool Diameter



Machine Dimensions

Chip conveyor right side outlet type



NTY³ 250



Super NTY³ Jumbo



Standard Bar capacity

80

Standard Chuck size

10"

Tooling System Diagram



AC1310 6,000min⁻¹ (MAX. 16)
Cross Holder (Std.)

AC1313 6,000min⁻¹ (MAX. 16)
Straight Holder (Std.)

Qualified Tool
□25 x 100
(25.4 x 100)

Qualified Tool
□25 x 150
(25.4 x 150)

Qualified Tool
□20 x 95
(19.05 x 95)

Qualified Tool
□20 x 125
(19.05 x 125)

Qualified Tool
□25 x 130
(25.4 x 130)

Qualified Tool
□20 x 125
(19.05 x 125)

N317 (32)
N318 (31.75)
Set ring

N317 (25)
N318 (25.4)
Set ring

R2402
R2402
R2401
R2401

HS130 (6) **HS131** (8) **HS132** (10)
HS133 (12) **HS134** (16)
M2682 (1/2", 1-1/4")
M2688 (3/8", 1-1/4")
Tool Holder

HS127 (MT-3) **HS126** (MT-2)
HS125 (MT-1)
N1127 (MT-3) **N1126** (MT-2)
N1125 (MT-1)
Drill socket

N1151 (25) **N1150** (20)
M2885 (3/4", 1-1/4") **M2886** (1/2", 1-1/4")
M2887 (5/8", 1-1/4")
Round hole bush

M2112 (12) **M2113** (10)
M2122 (1/2") **M2123** (3/8")
Tool Holder

M2114 (MT-1) **V1115** (MT-2)
M2124 (MT-1) **V1125** (MT-2)
Drill socket

Z1910 (20) **Z1911** (16)
M2120 (3/4") **M2121** (5/8")
Round hole bush

Qualified Tool
□20 x 102
(□3/4" x 4")

Z7411 * / **Z7421** *
Turning Holder (A)
Forward

Z7412 * / **Z7422** *
Turning Holder (A)
Reverse

Z7413 * / **Z7423** *
Turning Holder (AL)
Forward

Z7414 * / **Z7424** *
Turning Holder (AL)
Reverse

W1431 * / **W1441** *
Turning Holder (A)
Forward

W1432 * / **W1442** *
Turning Holder (A)
Reverse

R1431 / **R1441**
Cut-o -Holder
Forward

R1432 / **R1442**
Cut-o Holder
Reverse

R1413 / **R1423**
Turning Holder (AL)
Forward

R1414 / **R1424**
Turning Holder (AL)
Reverse

Z2415 * / **Z2425** *
Turning Holder (B)

W1415 * / **W1425** *
Turning Holder (B)

Z2417 * (32)
Z2427 * (1- 31.75)
Boring Holder

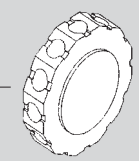
W4437 * (25)
W4447 * (25.4)
Boring Holder

R8418 * (25)
R8428 * (25.4)
Multi boring holder

R8453 * (3- 25)
R8463 * (3- 25.4)
Triple Boring Holder

R8451 (□20, 25)
R8461 (19.05, 25.4)
Turning Boring Holder

R1452 (2-□20)
R1462 (2-19.05)
Double turning holder



Turret Head

Metric
Inch

24st

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)	32mm

Rotating tool	
Rotary system	Individual rotation
Spindle speed	6000min ⁻¹
Spindle speed range	Stepless
Number of rotation tool station	12 x 3
Tool shank	Straight holder 1mm - 16mm
Cross holder	Cross holder 1mm - 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	18.5/11kW	169/120/86/63N·m 5,000min ⁻¹	-
Option	-	-	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 x 2580mm
Floor space	5350mm x 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.

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

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.



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