

SC-450L

NAKAMURA-TOME
PRECISION INDUSTRY CO.,LTD.

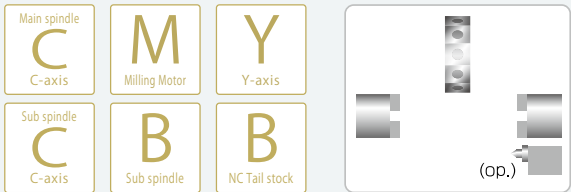
φ810mm
Max. Swing Diameter

Innovative
Technology

~Creating new values~

SC-450L

12,15-inch class single-turret machine with a high rigidity box-way slide.
Long bed specification with a maximum machining length of 1,520 mm, ideal for heavy-duty machining of large workpieces.



Traditionally hand-scraped and fitted slides

Spindle and slide units are mounted on the machine bed by highly-qualified technicians, and each machine does not leave the production line before undergoing the most stringent quality control checks. This machine does not only feature high capabilities, but also high performance and reliability, delivered from a machine tool manufacturer who has fostered high accuracy and precision manufacturing technology over many years.

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.

Main spindle

Standard	
Bar capacity	φ81mm
Spindle speed	2,500min ⁻¹
Spindle motor	30/22kW
Option	
Bar capacity	φ89mm
Spindle speed	2,500min ⁻¹
Spindle motor	30/22kW

Turret

Turret

Standard	
Type of turret head	Dodecagonal
Number of indexing positions	12
Option	
Milling spindle speed	3,600min ⁻¹
Milling motor	5.5/3.7kW
Y-axis slide travel	±75mm

Main spindle

Sub spindle (MATA-BEI / op.)

Option	
Bar capacity	φ71mm
Spindle speed	3,500min ⁻¹
Spindle motor	15/11kW

Tailstock(op.)

Option	
Driving system	NC control servo-driven type
Travel	1,490mm
Quill taper	MT-5 (Rotating center / Built-in center)
Range of thrust force	2.5 - 6.5kN / 2.5 - 11kN (op.)

The programmable NC Tailstock is servo-driven. Position and thrust can be easily set on the NT NURSE screen for a maximum of 12 registrable settings.

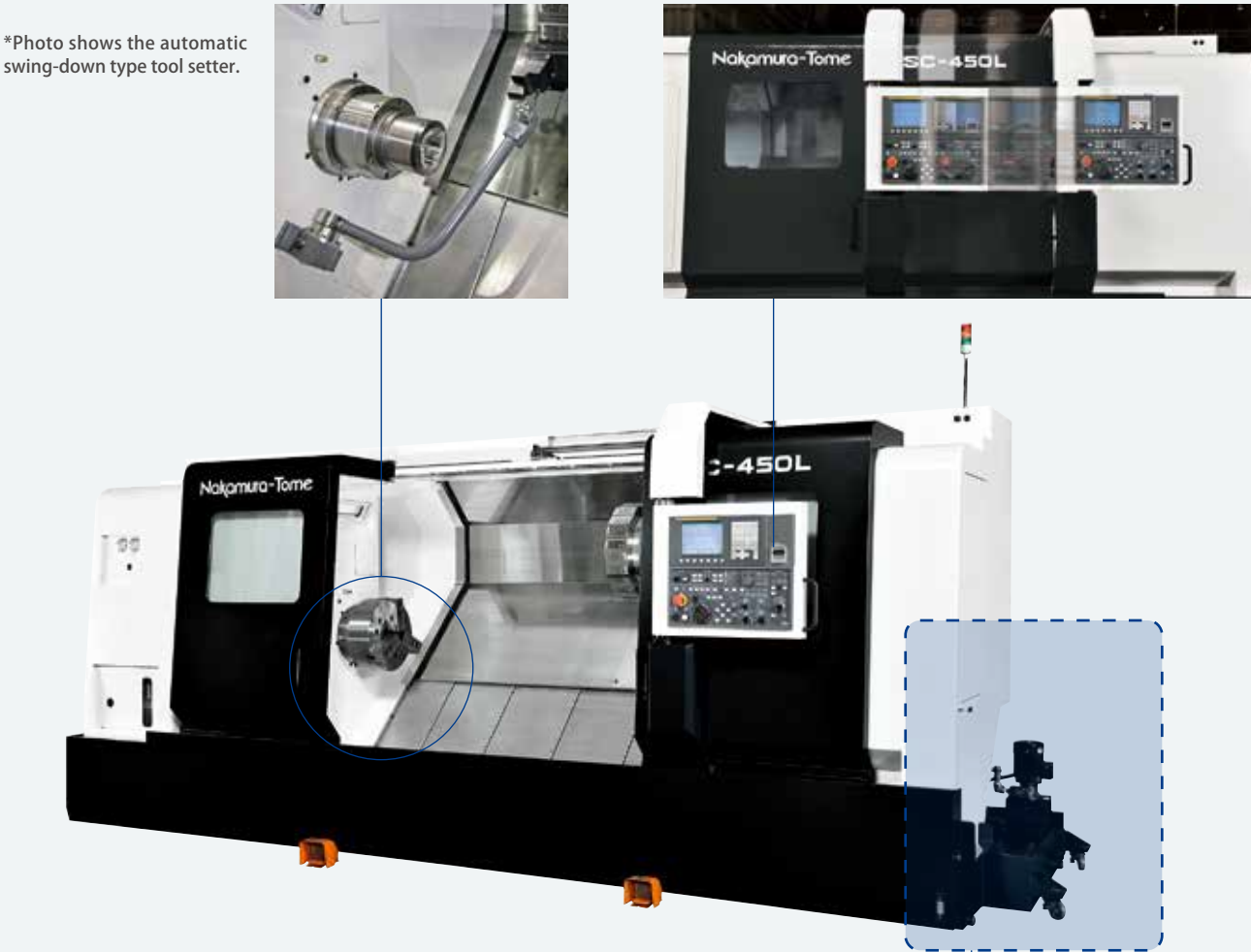
Tool setter(op.)

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

*Photo shows the automatic swing-down type tool setter.

Sliding Operation Control Box

The control box can swing at 100 degrees and move 1m sideways for easy operation.



Heavy cutting

Cutting sectional area : Max. 9mm²

- Cutting speed : 120m/min
- Cutting depth : 10mm
- Feed : 0.9mm/rev
- Material : S45C (JIS)

Parts catcher type A(op.)

Discharging of remnants and finished parts can be automated.

- Method : Swing-in Bucket
- Part size : φ80×150mm
- Weight : 3.0kg
- Cycle time : 5s
- Ejecting method : Chute

Side discharge chip conveyor(op.)

Full Operator Support :
User-Friendly and Highly Reliable

Jig-less!
Setup-less!
Skill-less!

This essential function for
multitasking machines
is standard.



Main Features

Standard

NT WORK NAVIGATOR

Airbag (Overload detection)

Advanced NT NURSE

NT Smart Sign

Digital Chuck Interlock

Option

NT Manual Guide i
(LUCK-BEII)



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 NURSE screen.
Setup time and machining cycle time are
reduced.

Airbag (Overload detection)

The software's barrier system is not foolproof. Making a data input mistake will result in a machine collision. However, Nakamura-Tome machines will not break even after the machine collision.

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.



Without Airbag

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



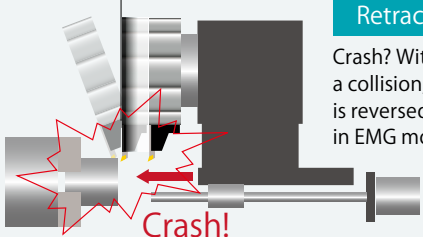
▲Video



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.



* It is not a function that guarantees the prevention of machine break.
This function does not eliminate the impact on the machine.

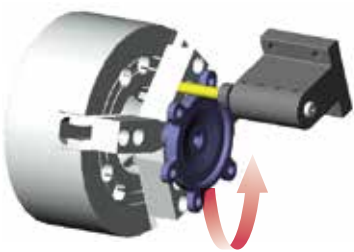
Barrier?
Even with barrier
function, machine
collisions may
occur.

NT WORK NAVIGATOR



No
fixtures
required

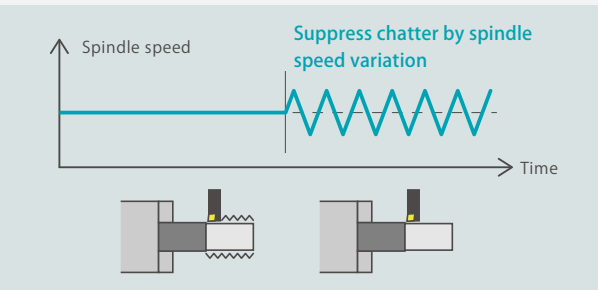
Machining parts with non-round shapes, such as
forgings or castings require that the raw part coordinates
be recognized by the CNC control.
It works just by touching the part with a simple inexpensive probe (mostly
a round bar mounted on a tool holder) and using the torque control feature
of the servo-motor, 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

Chatter Cancellor

Reduce the chatter and vibration by automatically changing the spindle
speed up/down continuously during cutting.
The function can be easily 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.

Featuring Functions to Make Programs
Faster and More Efficiently

Advanced NT NURSE

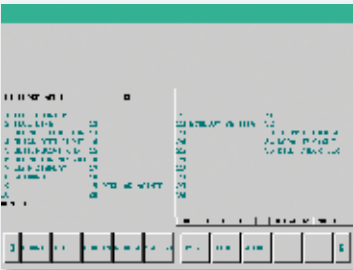
※Depending on machine specifications,
some functions are not available.

All-in-one
software!

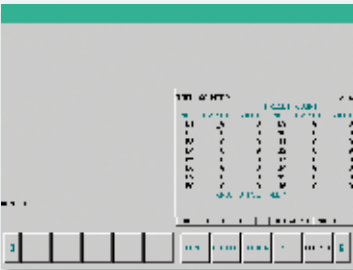
NT NURSE is software that provides the operator with user-friendly support for operation, programming and production on the machine. Among vital features are phase recognition (a must for multitasking), direct chucking to prevent positioning error during transfer, and perfect synchronization of the left and right hand spindles.

Among other features, are the load monitor for detecting tool wear and tool breakage, tool life management, operation condition monitoring, in addition to many other features to simplify programming, set up, operation and production, all offered in one single package.

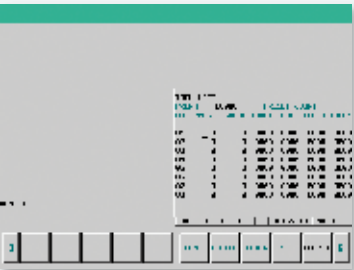
Useful functions



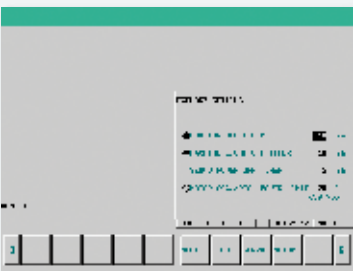
Menu Screen



Tool Counter



Tool Life



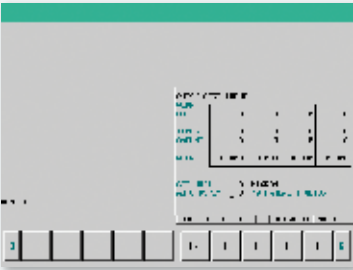
Energy Saving



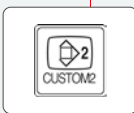
Operation Condition of each Tool



Operation Message



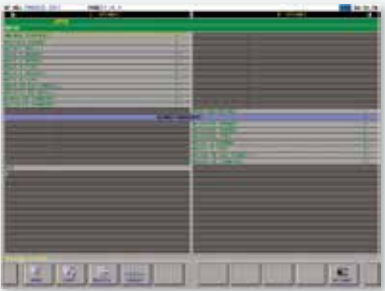
Quick Offset



NT NURSE Call Button

NT Manual Guide i (LUCK-BEI II) — Option

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.

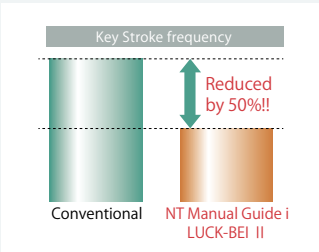


▲ Fixed-form sentence function
NT Manual Guide i contains more than 300 types of fixed form sentences. Operator can select these fixed form sentences for the program from a menu screen.



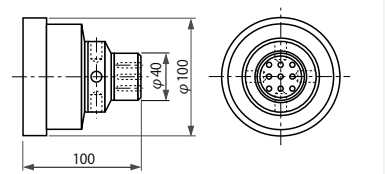
▲ Simulation
Accurate simulation of turning and milling operations using a 3D solid model.

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 are automatically input.

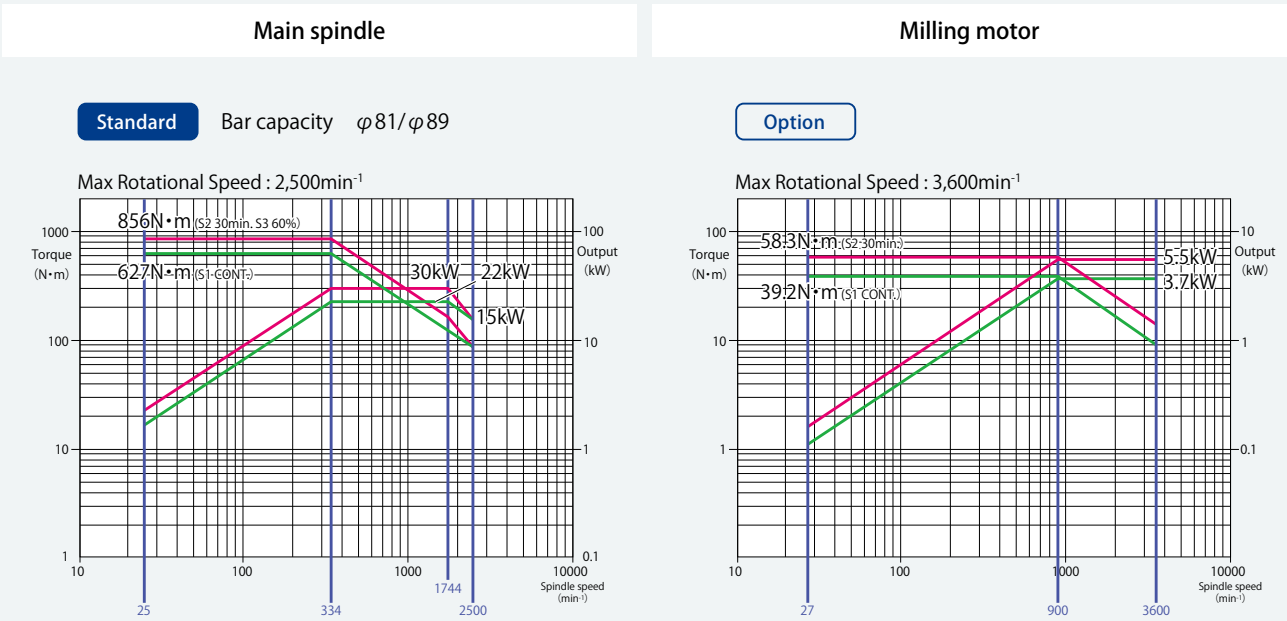


By setting the surface roughness, machining conditions are automatically input.

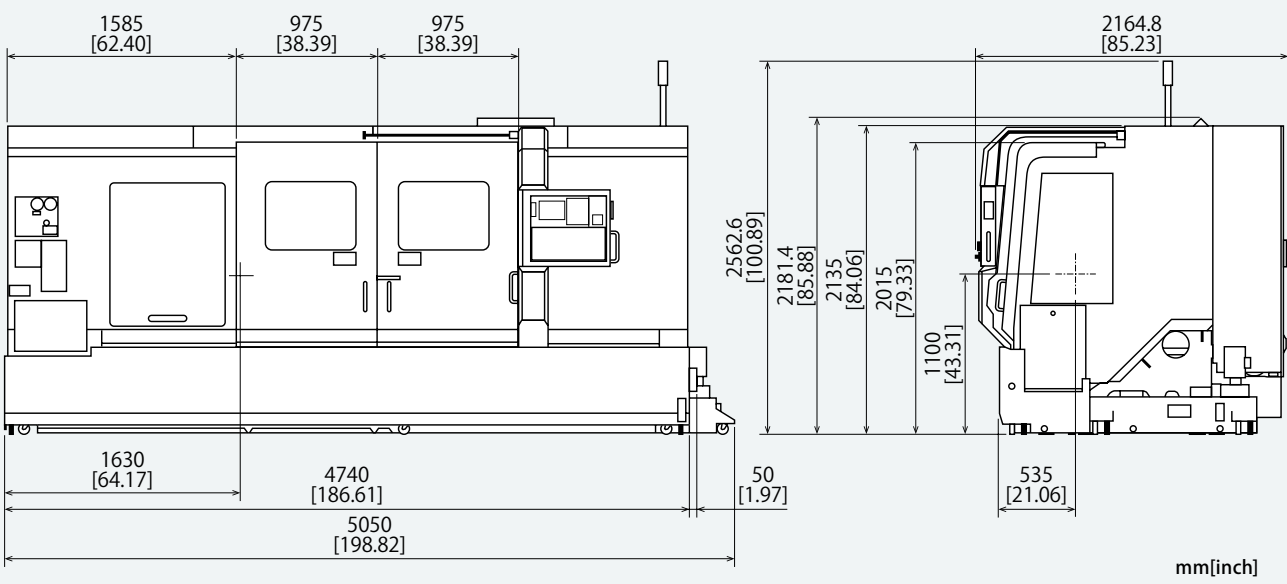


Cutting conditions for end mill.

Torque/Output Chart



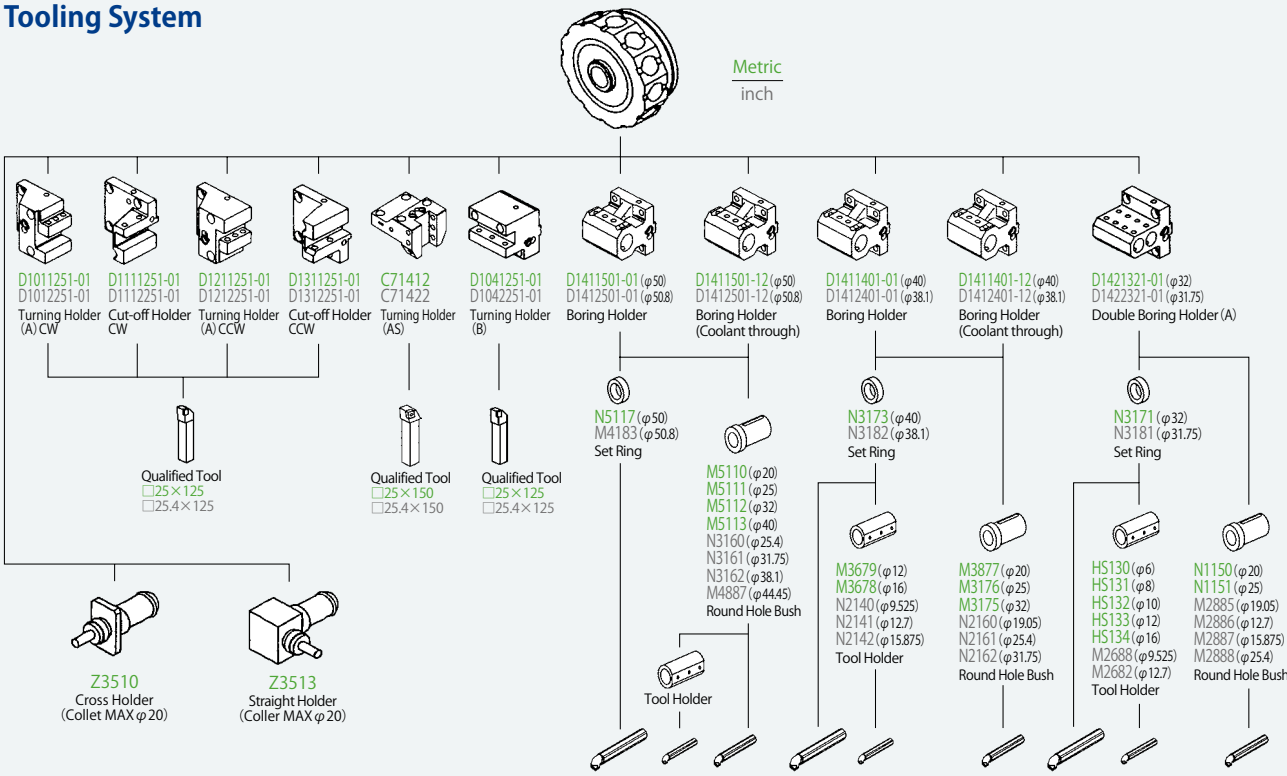
Machine Dimensions



Sub spindle (MATA-BEI)

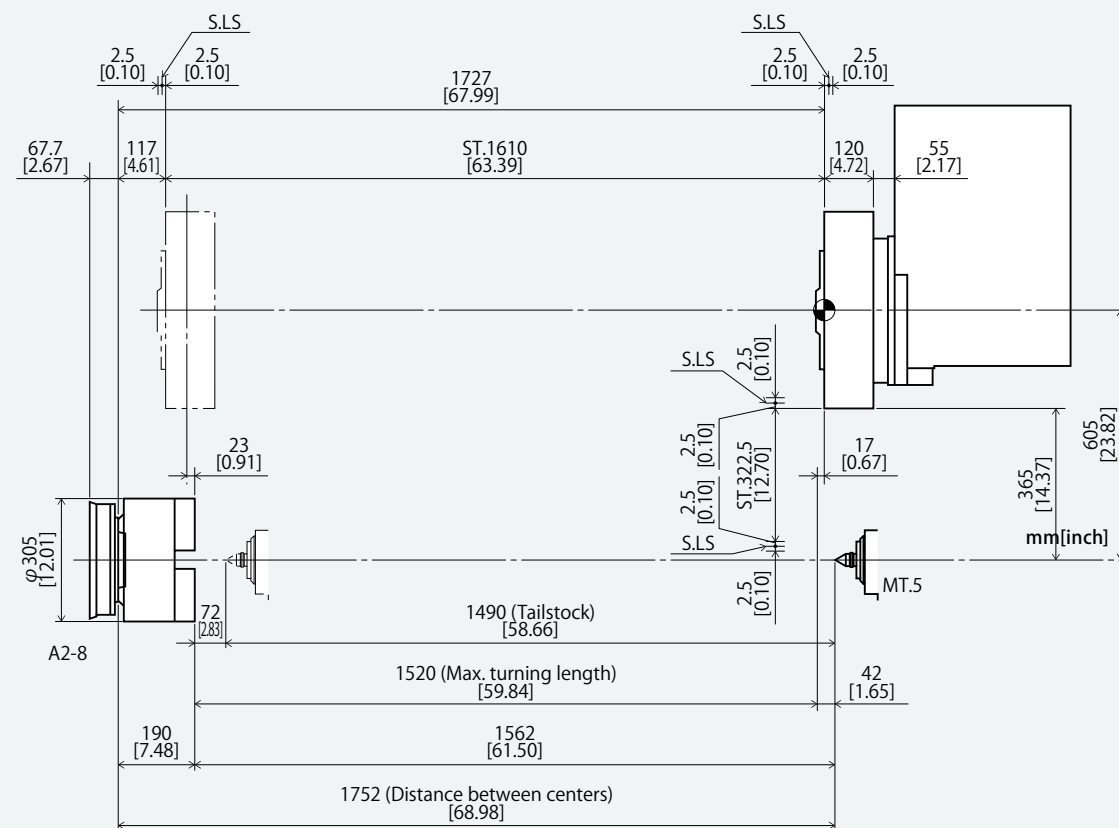


Tooling System

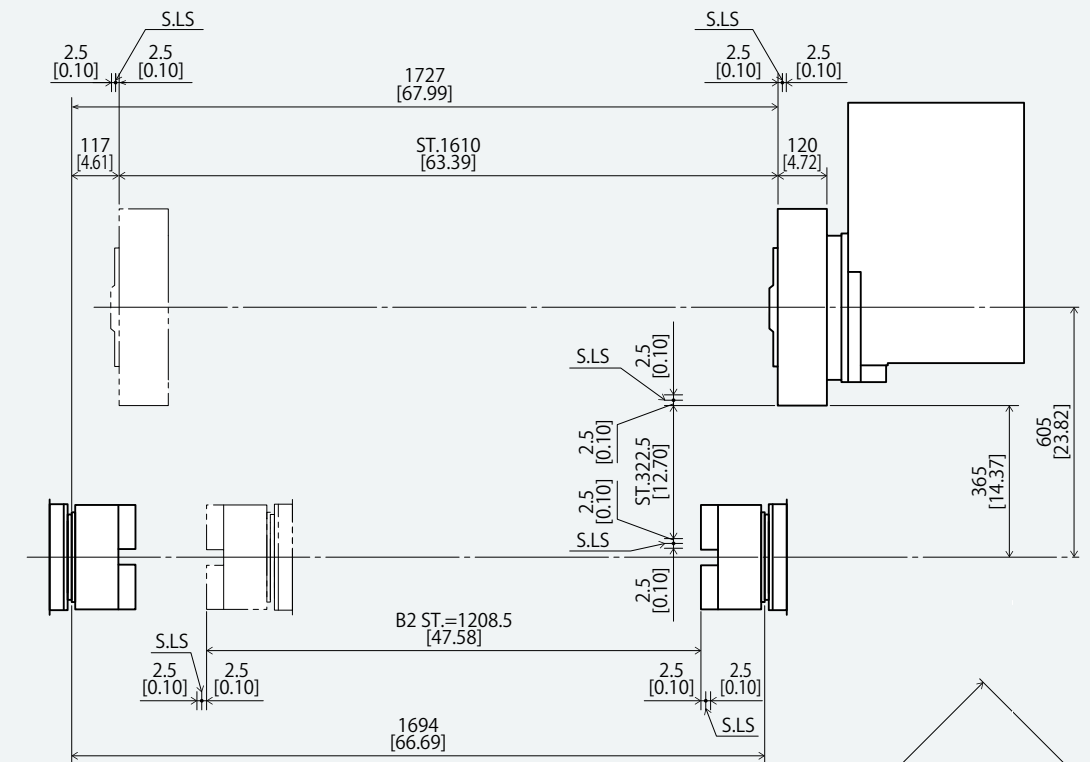


Travel Range

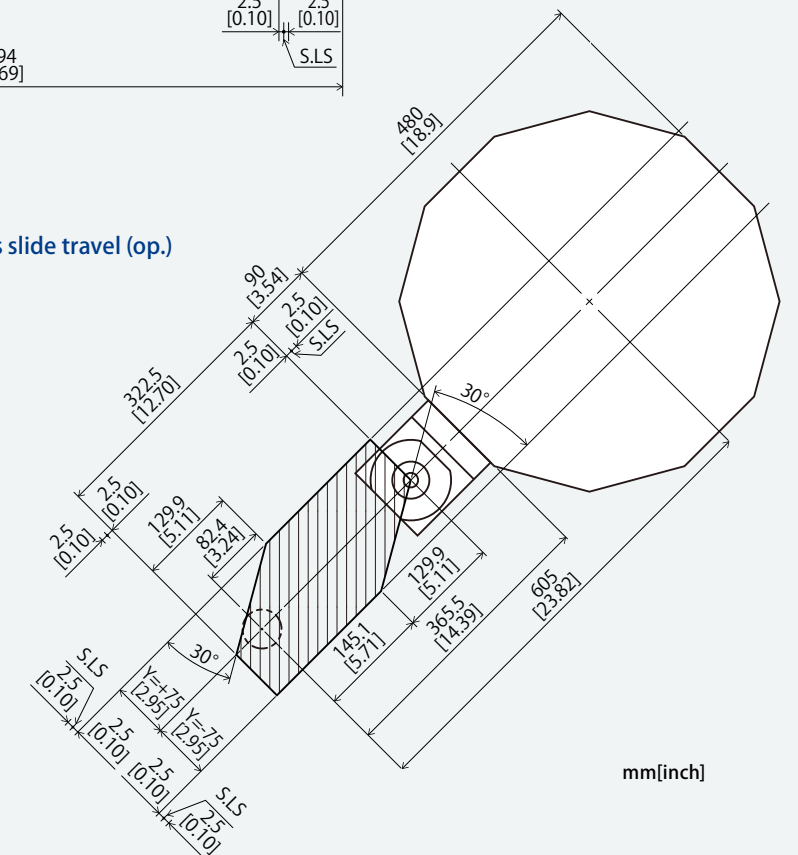
NC tailstock (op.)



Sub spindle (MATA-BEI / op.)



Y-axis slide travel (op.)



■ Capacity		φ81	φ89(op.)	φ71(op.)
Max. turning diameter		480mm		
Distance between spindles (op.)		1,694mm		
Distance between centers (op.)		1,752mm		
Max. turning length		1,520mm		
Bar capacity	L	φ81mm	φ89mm	-
	R(op.)	-	-	φ71mm
Chuck size	L	12"	15"	-
	R(op.)	-	-	10"

■ Axis travel	
X-axis slide travel	322.5mm
Z-axis slide travel	1,610mm
Y-axis slide travel (op.)	±75mm
B2-axis slide travel (op.)	1,208.5mm

■ Rapid feed	
X-axis rapid feed rate	18m/min
Z-axis rapid feed rate	24m/min
Y-axis rapid feed rate (op.)	9m/min
B-axis rapid feed rate (op.)	15m/min

■ Main spindle	
Spindle speed	2,500min ⁻¹
Spindle speed range	Stepless
Spindle nose	A2-8
Hole through spindle	100mm
I.D. of front bearing	140mm
Hole through draw tube	82mm

■ Sub spindle (MATA-BEI / op.)	
Spindle speed	-
Spindle speed range	-
Spindle nose	-
Hole through spindle	-
I.D. of front bearing	-
Hole through draw tube	-

■ C-axis (op.)	
Least input increment	0.001°
Least command increment	0.001°
Rapid speed	200min ⁻¹
Cutting feed rate	1-4,800° /min
C-axis clamp	Disk clamp
C-axis connecting time	1.5s

■ Turret	
Type of turret head	Dodecagonal
Number of Indexing positions	12
Tool size (square shank)	□25mm
Tool size (round shank)	φ50mm

■ Milling (op.)	
Rotary system	Individual rotation
Milling spindle speed	3,600min ⁻¹
Spindle speed range	Stepless
Number of milling stations	12
Tool size	Straight holder φ1mm-φ20mm
	Cross holder φ1mm-φ20mm

■ Tailstock (op.)	
Driving system	NC control servo-driven type
Travel	1,490mm
Quill taper	MT-5 (Rotating center / Built-in center)
Range of thrust force	2.5 - 6.5kN / 2.5 - 11kN (op.)

■ Drive motor	
Main spindle motor	30/22kW
Sub spindle motor (op.)	-
Milling motor (op.)	5.5/3.7kW

■ General	
Height	2,184.9mm / 2,531.3mm (op. Y-axis)
Floor space (L x W)	5,050mm × 2,164.8mm
Machine weight (incl. control)	9,000kg / 10,000kg (op. Y-axis)

■ Power requirements	
Power supply	39.1kVA (Standard)

- **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	Nakamura-Tome FANUC 0i-TD
■ Controlled axes	
Controlled axes	2 axes (X, Z)
Simultaneously Controlled axes	2 axis

■ Input command	
Least input increment	0.001mm/0.0001inch (diameter for X-axis)
Least command increment	X: 0.0005mm, Z: 0.001mm
Max. programmable dimension	±999999.999mm / ±39370.0787inch, ±999999.999°
Absolute/ Incremental programming	X, Z / U, W
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 (op.): 1-4800mm/min, 0.01-188inch/min C (op.): 1-4800° /min B2 (op.): 1-4800mm/min, 0.01-188inch/min feed/rev: 0.0001-500.0000mm/rev, 0.000001-9.999999inch/rev
Dwell	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
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%)
Look ahead control	G08

■ Program memory		
Part program storage length / Number of registrable programs	512Kbyte Total 1280m 1Mbyte Total 2560m (op. MATA-BEI)	400 800 (op. MATA-BEI)
Parts 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	
Operation panel : Display	10.4-inch color LCD
Operation panel : Keyboard	Separate type MDI unit

■ Programming assist functions	
Circular interpolation R programming	Standard
Direct drawing dimension programming or Chamfering/ Corner R	Standard (Change over on setting parameter)
Canned cycles	G90, G92, G94
Multiple repetitive canned cycles	G70 - G76
Multiple repetitive canned cycles II	G71, G72
Canned cycles for drilling	G80 - G89
Sub program	Standard
Help function	Standard
Custom macro	Standard (common variables #100 - #149, #500 - #549)
Additional custom macro variables	Standard (After addition, #100 - #199, #500 - #999)
Abnormal load detection function	Standard
NT WORK NAVIGATOR	Standard (not including contact bar)
NT NURSE	Standard

■ Machine support functions	
Spindle rigid tapping	Standard
Spindle orientation	Standard

■ ECO functions	
Servo motor power off	Standard (Switch on Power Saving Mode in NT Setting screen)
Control of motor output during acceleration and deceleration	Standard (Switch on Power Saving Mode in NT Setting screen)
G-code for servo motor energy-saving during acceleration and deceleration	G356/G357
Automatic light off	Standard (Switch on Power Saving Mode in NT Setting screen)
Automatic monitor off	Standard (Switch on Power Saving Mode in NT Setting screen)



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