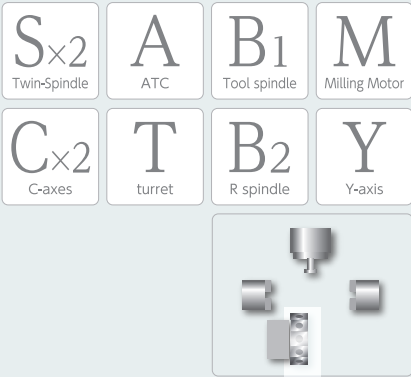# MX-100

Flexibility and Compact Floor Space

Innovative Technology
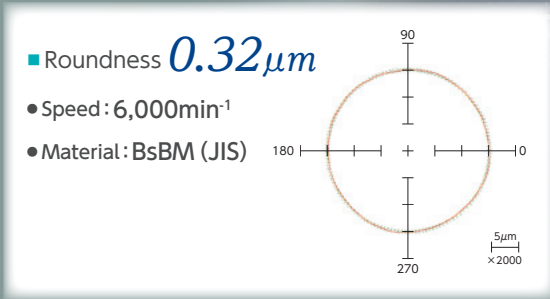
~ Creating new values ~

MX-100

State-of-the-art, compact high-precision Multitasking Machine, with the capabilities of a Machining Center and a Turning Center, featuring advanced software, smart features and up to 96 tools, to ensure high-productivity machining of a wide range of parts, and to smartly meet the needs of various manufacturing sectors.

- Milling·Y-axis standard
- ATC tool spindle standard
- Tool spindle power 11/7.5kW

  Spindle speed 12,000min^{-1} (op. 20,000min^{-1})
- ATC storage capacity 36 tools (op. 48, 72 tools)
- X-axis travel up to 50 mm below spindle center.
  Y axis travel ± 105 mm with respect to the spindle center
- Floor space 4,350mm x 2,795mm (including chip tank)
- Lower turret milling motor power 7.1/2.2 kW
  with Max. speed 6,000 min^{-1}
- Eco-friendly: Grease lubrication of slide axes
- Advanced software and Smart features

| S×2 Twin-Spindle | A ATC | B₁ Tool spindle | M Milling Motor |
| C×2 C-axes | T turret | B₂ R spindle | Y Y-axis |

Perfection and Flexibility

- Roundness $0.32\mu m$
  - Speed：6,000min^{-1}
 - Material：BsBM (JIS)

90
180 | 0
270
5μm
×2000

The MX-100 is a compact Multitasking Machine with a wide machining range, and up to 96 tools (72 tools for ATC[op.] and 24 tools for lower turret),ensuring versatility and maximum performance in a small footprint.

The built-in spindle motors feature superior cutting capabilities, with the possibility to upgrade the left spindle to 15/11 KW motor (Bar capacity Dia. 65mm op.) , ensuring higher performance and more rigidity.

With the MX-100, Nakamura-Tome continues its pursuit not only to offer high-accuracy and high-rigidity, but also to ensure the highest performance and the most outstanding cutting capabilities.
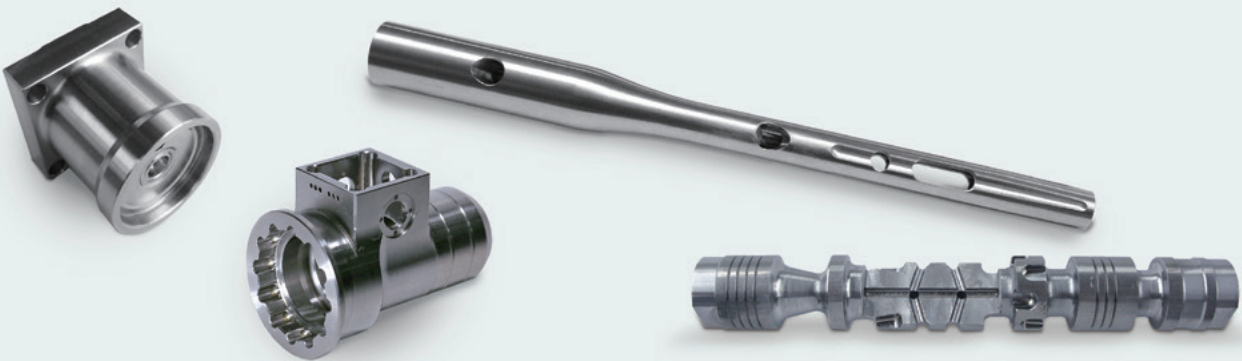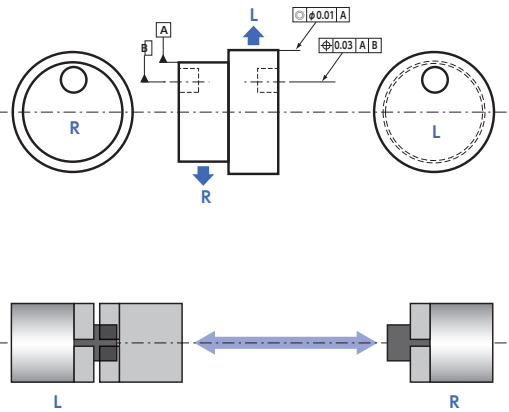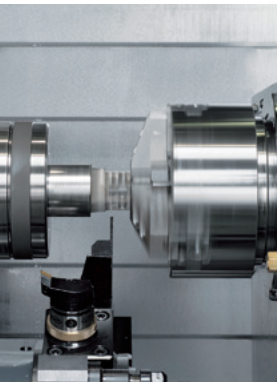
Turning
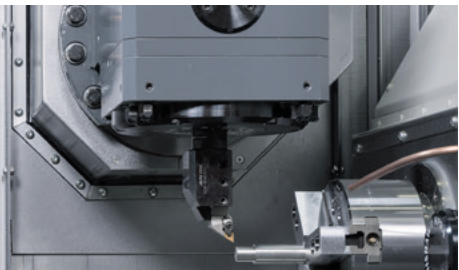
L-Spindle
- Cutting cross section $2.25mm^2/rev$
- Depth of cut $5mm$
- Feed $0.45mm/rev$
- L-Spindle motor $11/7.5kW$

Material : S45C

Milling

Tool spindle
- Metal Removal Rate $57.30cc/min$
- Tool spindle motor $11/7.5kW$

Lower turret
- Metal Removal Rate $18.88cc/min$
- Milling motor $7.1/2.2kW$

Material : S45C

Part Transfer Accuracy

L
$\odot|\phi0.01|A$
$\oplus|0.03|A|B$
A
R
L
R

L
R

Outside turning coaxiality
- Required accuracy $\phi0.01mm$
- Actual value $\phi0.005mm$

Hole positioning accuracy
- Required accuracy $\phi0.03mm$
- Actual value $\phi0.009mm$

Solid performance.
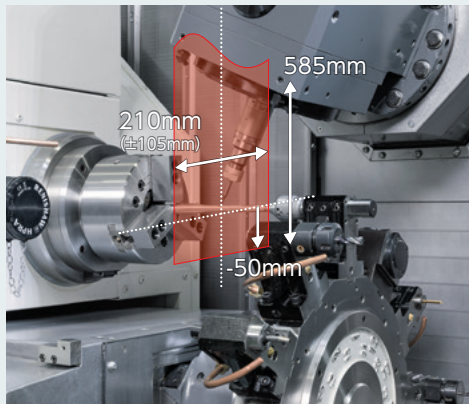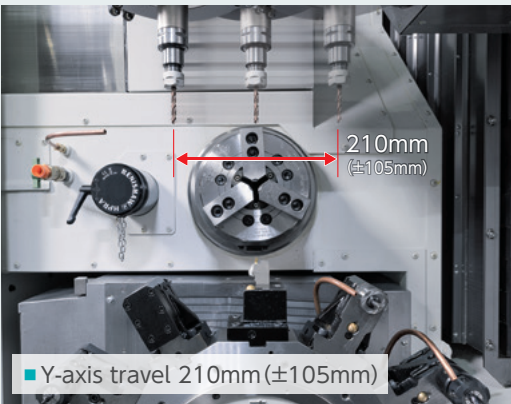## Combining the Capabilities of a Machining Center and a Turning Center.

■ Bar capacity φ51, φ65mm (op.)

L-Spindle motor
$11/7.5kW$, $15/11kW$ (op.)
$6,000min^{-1}$, $4,500min^{-1}$ (op.)

Tool spindle

L-spindle

Tool spindle motor
$11/7.5kW$
$12,000min^{-1}$, $20,000min^{-1}$ (op.)

Lower turret motor
$7.1/2.2kW$, $6/1.5kW$ (op.)
$6,000min^{-1}$, $8,000min^{-1}$ (op.)

turret

R-spindle

■ Bar capacity φ51mm

R-Spindle motor
$11/7.5kW$
$6,000min^{-1}$
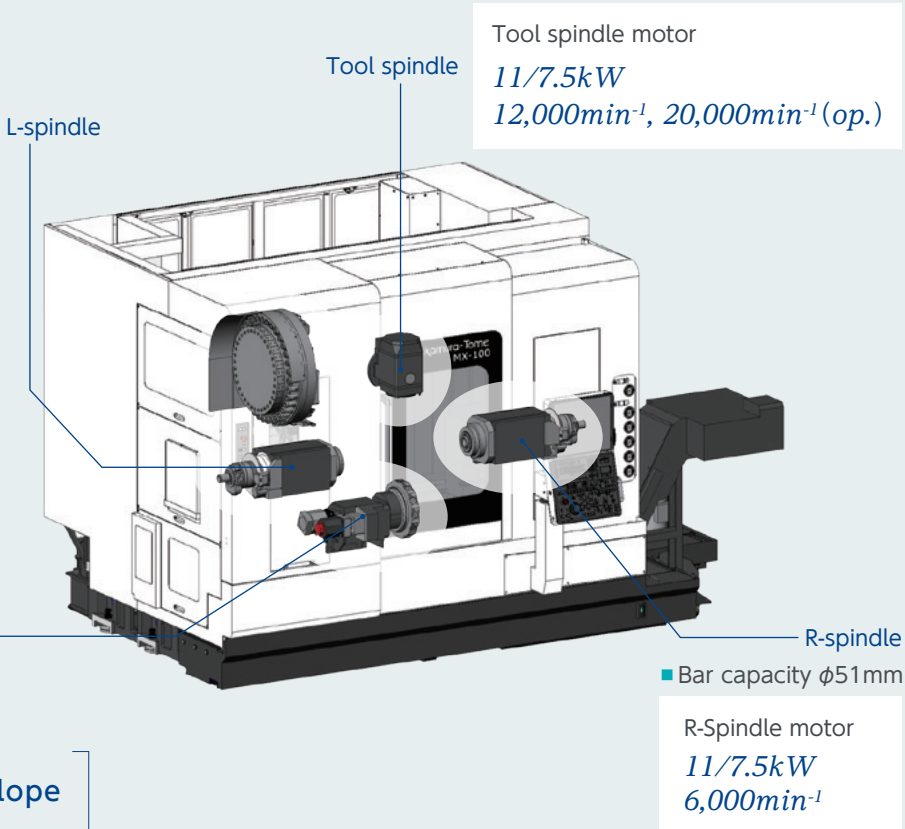
Ensuring a large work envelope in a compact machine

210mm (±105mm)

585mm

210mm (±105mm)

50mm

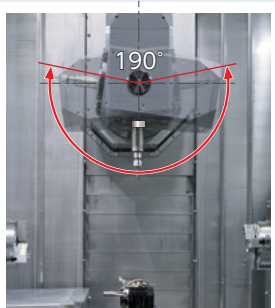■ Y-axis travel 210mm (±105mm)

High accuracy machining.

Thanks to large Y-axis travel and 50mm X-axis travel beyond the spindle center, various machining operations can be performed without rotating the C-axis, such as square milling in the X-Y plane or deep hole drilling in the X-axis direction, ensuring faster cycle time and higher precision.

Floor space (Machine only)
Standard specification
$$L3,200mm \times W2,485mm \times H2,662mm$$
*not including chip tank or chip conveyor.

190°

ATC
36 (op.48,72)

Compact Loader is available.

Max. tool diameter
(Without adjacent tool)
$Φ80mm$

Max. tool length
$180mm$

NT SmartX

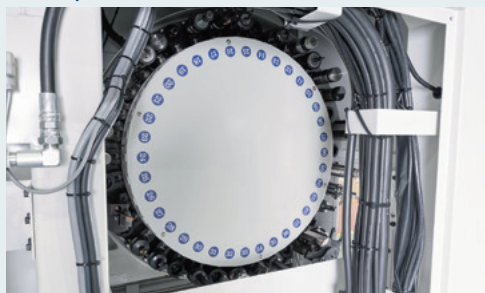## 96 tools

Up to 96 tools available!

In addition to 36 (op. 48 or 72) ATC tools for Tool Spindle, up to 24 turning tools (12 milling tools) can be mounted on the lower turret.

36 (op.48,72) ATC tools

Max. tool diameter	55mm (80mm Without adjacent tool)
Max. tool length / Max tool weight	180mm / 4kg
Tool shank type	Sandvik Capto C4
Tool change time	1.3 Sec
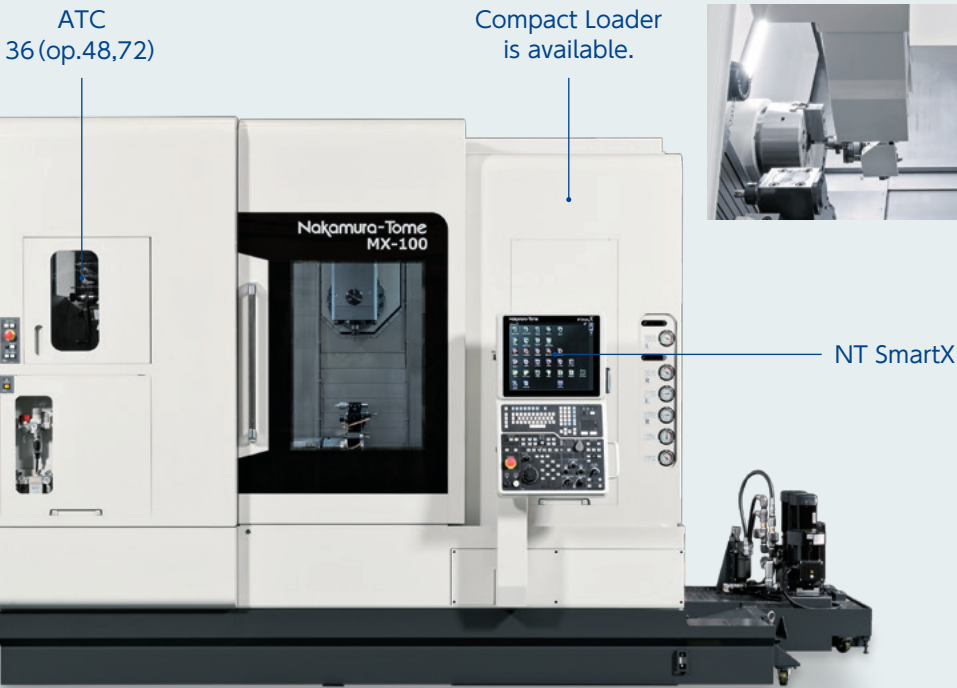
ATC Maintenance Navigator

In addition to the information about the ATC status and position of the Tool Changer arm. The step by step ATC recovery guidance screen ensures fast ATC recovery and shorter machine down time.

Lower turret

Type of turret head	Dodecagonal drum turret / 24st
Number of tools	24 tools (turning tools)
Number of driven-tool stations	12
Milling tool size	Φ1～Φ14mm

Various Options to Meet Customers Needs.
Total Provider for Peripheral Equipment.

Whether it is machine set up, cutting chip management,
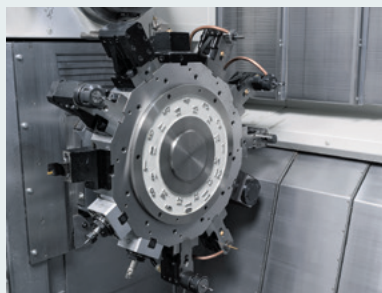higher efficiency or improved productivity,
Nakamura-Tome offers top class peripheral equipment,
which boosts the performance of our Multitasking Machines.
As a total solution provider with a vast experience,
Nakamura-Tome offers complete solutions, including
Multitasking Machines complemented with a variety
of peripheral equipment.
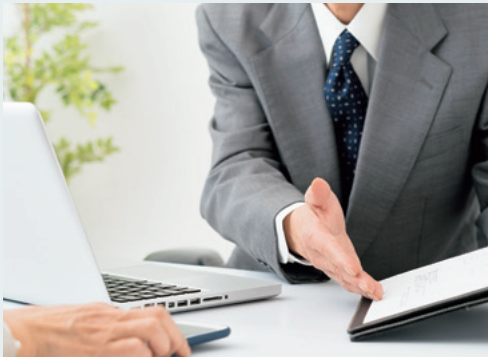
Parts Catcher Type G

Compact Loader

Fire protection damper

Duct for Oil Mist Collector

Coolant pump

In-process measuring system

Chip conveyor

Oil skimmer

and many others ...
For not Listed Items, please
contact your Nakamura-Tome
representative.

NT Smart X

Full Operator Support from Ease of Use to Reliability

Main features of NT SmartX

Standard	
• NT Work Navigator	• Parts Catcher G Operation Function
• Airbag	*Available when Parts Catcher G is equipped
(Overload detection)	• NT Machine Simulation
• NT Nurse function	• NT Collision Guard
• Status Display Function	• NT Thermo Navigator AI
• Setup Display	• Digital Chuck Interlock
• Trouble Guidance	• NT Manual Guide i
• Productivity Function	• One touch MDI function
• Warm up Function	• 3D Smart Pro AI

19 inch color LCD touch panel	Original Menu screen
QWERTY keyboard	Voice Guidance
PC memory 8 GB	Multiple-Touch screen
	Touch pad

Nakamura-Tome AI

■ Powered by AI as standard equipment
・NT Thermo Navigator AI
・3D Smart Pro AI

Cut in check

Digital Chuck Interlock

Set the Chuck Open and Close detection position easily.
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 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.
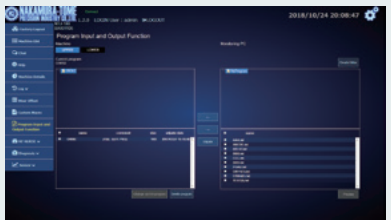

NT Smart Sign

Nakamura-Tome IoT software

■ 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.

Visualize

OK!
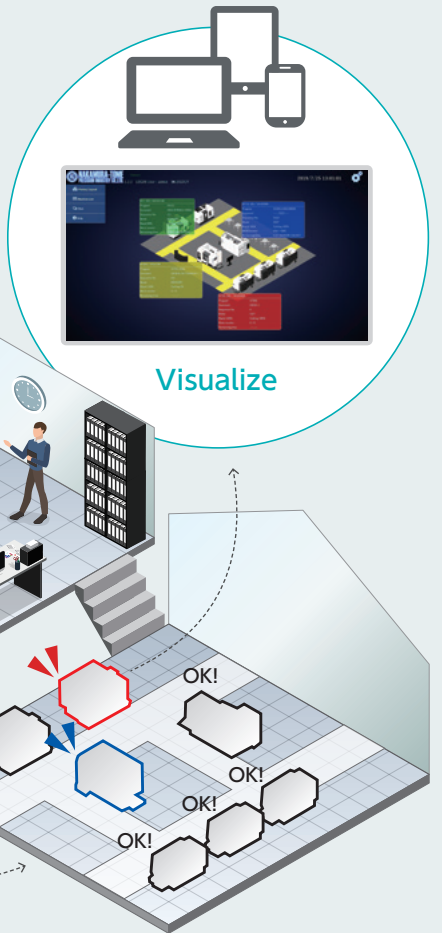
NT Thermo Navigator AI

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.

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

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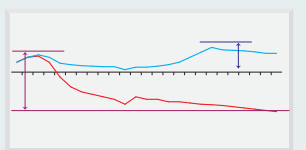
— Pre-correction thermal displacement data
— Thermal displacement data after correction

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.

0 10 20 30 40 50 ··· 380 390 400 410 420 (min)

Manually **420**min

3D Smart Pro AI **20**min 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.
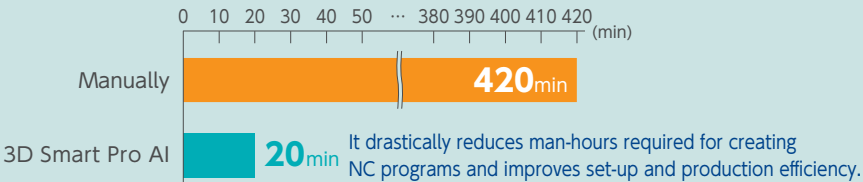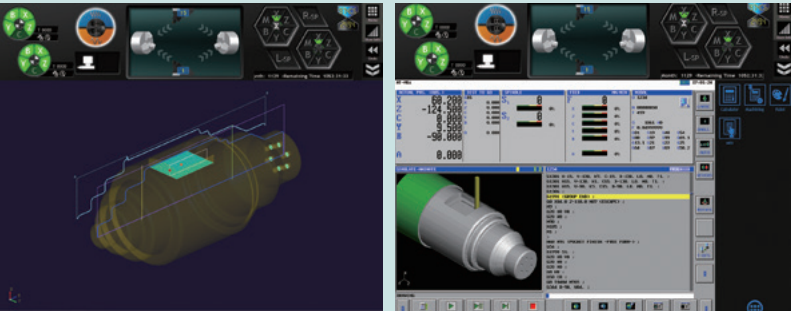
3. Tolerance setting
Once tolerance value is input, target value for machining can be set.

NT Work Navigator

X Y Z B C

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 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 eliminating the need for positioning fixtures and special clamping devices.

No fixtures required

▲Video
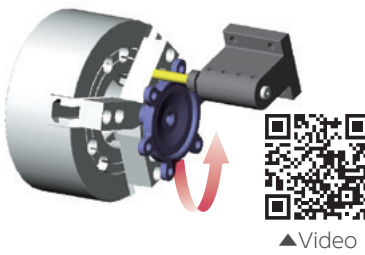
Double safety features for maximum protection

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

The machine is protected with dual safety features:"NT Machine Simulation / NT Collision Guard" prevent collision beforehand, and the "Airbag Function" minimizes damage to the machine in case of collision.

NT Machine Simulation

Preventive safety technology - Machine collisions are avoidable!
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 feed 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 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.

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 assured: Airbag !

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

The Airbag (Overload detection) of the machine tool greatly 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.

▲Video
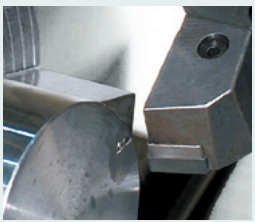
With Airbag
Retraction within 0.001 sec

Crash ! Within 1 millisecond after the crash, servo motor-feeding direction is reversed and the machine stops in EMG mode.

Crash!
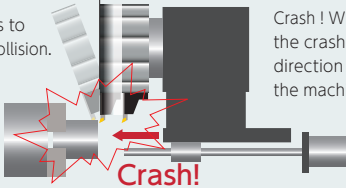
* This feature does not mean zero impact

Oscillation cutting (op.)

Simple Fanuc G-code.
By oscillating the tool for a certain period, the chips are cut into small pieces, This can resolve workpiece damage issues caused by chips curled around the part.

Missing

Current trajectory
Trajectory before one rotation
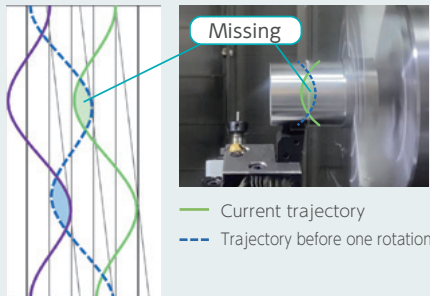
Material : Aluminum
Cutting speed : 200mm/min
Cutting feed : 0.1mm/rev
Cutting depth : 1.0mm

Torque/Output Chart

L/R Spindle motor — Standard

Max Rotational Speed : 6,000min⁻¹

Bar capacity φ51mm

117N·m (S2 30min⁻¹)
122N·m (S3 25%)
95.5N·m (S1 CONT.)
11kW
7.5kW

L- Spindle motor — Option

Max Rotational Speed : 4,500min⁻¹

Bar capacity φ65mm

170N·m (S3 25%)
129N·m (S2 30min⁻¹)
121N·m (S1 CONT.)
15kW
11kW

Tool spindle motor — Standard

Max Rotational Speed : 12,000min⁻¹ (Low speed)

60N·m (S3 10%)
49N·m (S3 15%)
38N·m (S3 25%)
22N·m (S1 CONT.)
7.5kW
3.7kW

Max Rotational Speed : 12,000min⁻¹ (High speed)

26N·m (S3 25%)
16N·m (S1 CONT.)
11kW
7.5kW
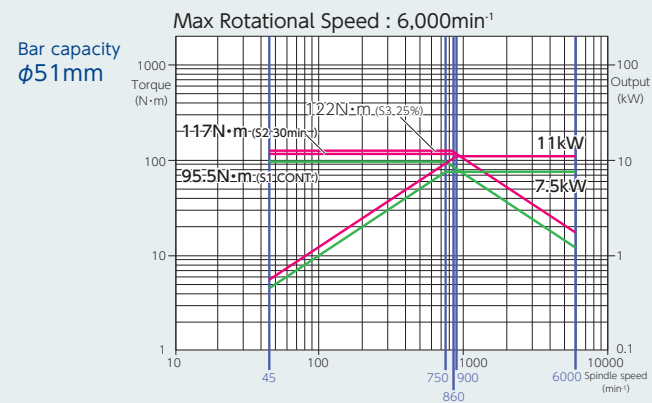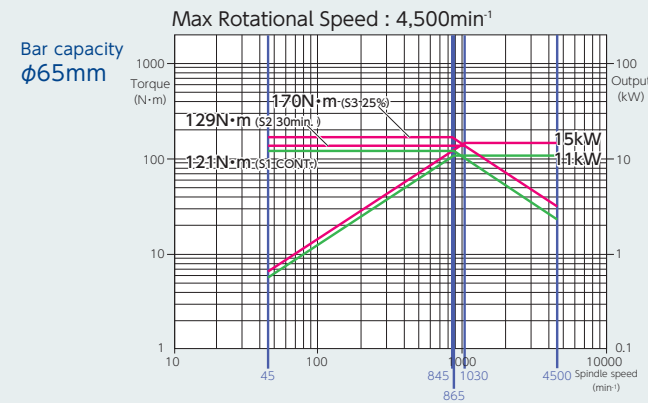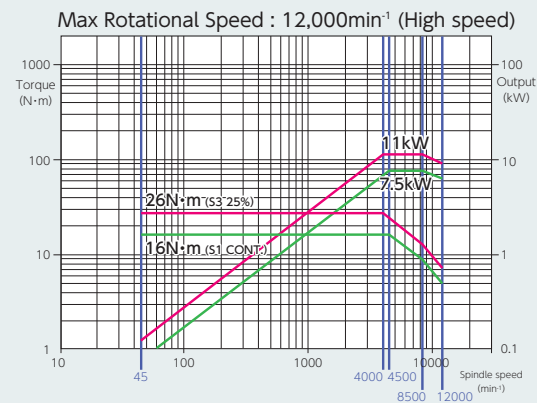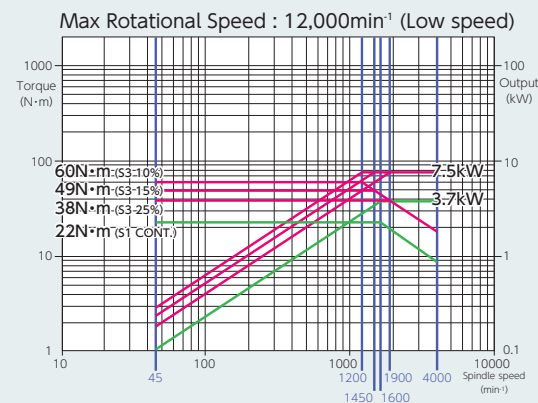
Milling motor — Standard

Max Rotational Speed : 6,000min⁻¹

7.1kW
16.0N·m (S3 15%)
2.2kW
8.0N·m (S1 CONT.)

Milling motor — Option

Max Rotational Speed : 8,000min⁻¹

6kW (S3 15%)
2.2kW (S2 15min,S3 60%)
16N·m (S3 15%)
11.7N·m (S3 25%)
3.7kW (S3 25%)
7N·m (S2 15min,S3 60%)
4.77N·m (S1 CONT.)
1.5kW (S1 CONT.)

Travel Range

*1 For tool spindle speed 20,000min⁻¹
*2 The dimensions given here may change depending on machine specifications.

mm[inch]
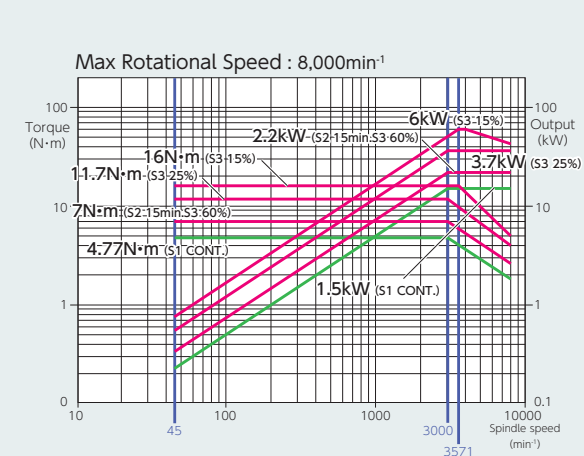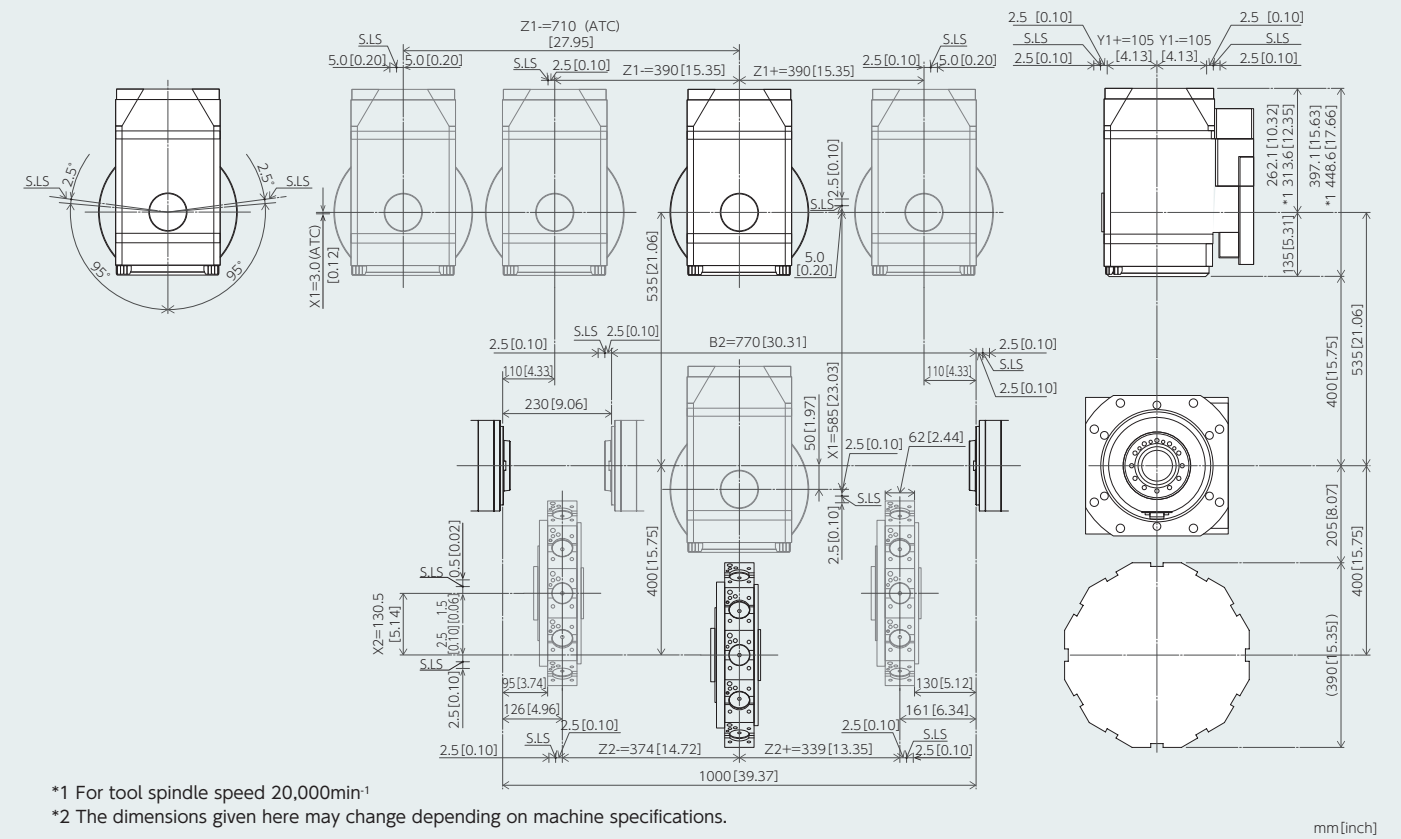
Machine Dimensions

*2 The dimensions given here may change depending on machine specifications.

mm[inch]

Tooling System

★Alps tool type AC・AR・ASS

★Alps tool type AC

Side cutter, Shoulder, Face milling

Face milling adapter
C4-391.05C-16 032 (0.4kg)
C4-391.05C-22 025 (0.4kg)

End mill tool

Straight collet

Hydro chuck adapter
CoroChuck® 930
For heavy cutting
930-C4-HD-20-084 (1.3kg)

Drill tool

393.CG-12xx40/20xx52 (φ3-16)
393.CGS-06xx27/12xx40/20xx52(φ3-18 Shield type)
393.CGS-20xx50 (φ9.7/11.7/15.7 Shield type)
393.CGP-20xx72 (φ3-12 Pencil type)
393.CF-12xx40/20xx50 (φ2.9-16 High precision collet)

Slim type
930-C4-S-12-080A/
20-090A (0.6/0.9kg)

Drill tool
(with coolant hole)

ER Collet
★AR Collet

Pencil type
930-C4-P-06-085 (0.4kg)
930-C4-P-12-100/135 (0.6/0.7kg)

Reamer

393.14-16/20/25/32d (φ1-20)
393.15-16/20/25/32d (φ3-20 Shield type)
★AR16/20/25/32-d (φ1-20)
★AR16/20/25/32OH-d (φ3-20 Shield type)

Collet chuck adapter
C4-391.14-16 070 (0.4kg)
C4-391.14-20/25 052 (0.3/0.4kg)
C4-391.14-32 054 (0.5kg)

Tap

Straight collet

Tap (with coolant hole)

★AS 16-d ASS20/25/32-d (φ6-25)

Milling chuck adapter
★AC4-TRX16-70 (0.7kg)
★AC4-TRX20-75 (0.9kg)

AR/GB Tap collet

End mill tool

★AR20GB-Mx (M4-12)
★AR25GB-Mx (M4-16)

Tap adapter
CoroChuck® 970
970-C4-11-080 (0.4kg)
970-C4-20-102 (0.7kg)
970-C4-25-122 (1.0kg)

CoroMill®
390

Weldon shank adapter
C4-391.20-06/08 050 (0.4kg)
C4-391.20-10 050A (0.5kg)
C4-391.20-12 055A (0.6kg)
C4-391.20-14/16 055 (0.6/0.7kg)

Delta Drill

Super U drill

ISO shank adapter
C4-391.27-16 056 (0.5kg)
C4-391.27-20 060 (0.5kg)
C4-391.27-25 077 (0.8kg)

Super U drill
CoroDrill® 880
880-Dxxxxx C4-03/04
(φ12 ~ 30/3xDC ~ 4xDC)

Morse taper shank drill

MT shank adapter
★AC4-MTA1-90 (MT1) (0.5kg)
★AC4-MTA2-95 (MT2) (0.6kg)
★AC4-MTA3-115 (MT3) (1.0kg)

Shoulder milling cutter
CoroMill® 490
490-025-C4-08M
490-032-C4-08M
490-040-C4-08M
490-044-C4-08M
490-040-C4-08H
490-044-C4-08H

End mill
CoroMill® 390
R390-016/020C4-11L
R390-025/032C4-11L
R390-025/032C4-11M
R390-040C4-11M11H
R390-044C4-11M060
R390-044C4-11M075

Long edge
CoroMill® 390
R390-044C4-45M
R390-044C4-43L

Long edge
CoroMill® 690
690-044C4-1046H

CoroMill® 790
Shoulder milling
for aluminum alloy

CoroMill® 210
For high feed /
plunge

CoroMill® 345
For plunge

CoroMill® 365
Milling cutter for
cast iron

Extension adapter
C4-391.01-40 060A (0.6kg)
C4-391.01-40 080A (0.7kg)
C4-391.01-40 040 (0.4kg)

Reduction adapter
C4-391.02-32 055A (C4⇒C3) (0.5kg)
C4-391.02-32 070A (C4⇒C3) (0.6kg)

Cutting head for OD Face turning
CoroTurn® RC
C4-DCLNR/L-27050-09/12 (0.4/0.5kg)
C4-DWLNR/L-27050-06/08 (0.4kg)

CoroTurn® 107
C4-SCLCR/L-27050-09/12 (0.4kg)
C4-SDJCR/L-27050-07/11 (0.4kg)

CoroTurn® TR
TR-C4-D13JCR/L-27050 (0.3kg)
TR-C4-V13JBR/L-27050 (0.3kg)

CoroTurn® Prime
C4-CP-30AR/L-27050-11C (0.5kg)
C4-CP-25BR/L-27060-11B (0.5kg)

Cutting head for grooving / cut off turning
C4-R/LF123D15/E15-27055B (0.4kg)
C4-R/LF123F20/G20-27060B/65B (0.4kg)
C4-R/LF123H25/J25/K25-27067/70B (0.5kg)

CoroCut® 1-2
C4-NF123G20-00070B (0.5kg)
C4-NF123J25-00077B (0.5kg)

CoroCut® SL
*Adapter 0°, 45°, 90° for SL
Refer to the Touring Catalogue

Cutting head for OD thread
CoroThread® 266
C4-266R/LFG-27050-22 (0.4kg)
C4-266R/LFGZ-27050-22 (0.4kg)

Cutting head for 45°OD turning
CoroTurn® RC
C4-DSDNN-00050-12 (0.4kg)   C4-PSDNN-00050-12 (0.4kg)
C4-DSSNR/L-27042-12 (0.4kg)   C4-PSSNR/L-27042-12 (0.4kg)
C4-DDNNN-00050-11 (0.4kg)
C4-DDNNN-00055-1504 (0.4kg)

Cutting head for boring
T-Max P
C4-PCLNR/L-17090-12M1 (0.5kg)
C4-PCLNR/L-22110-12M1 (0.6kg)
C4-PCLNR/L-27080-12M1 (0.7kg)
C4-PCLNR/L-27120-12M1 (1.1kg)

CoroTurn® 107
C4-SCLCR/L-11070-09 (0.3kg)
C4-SCLCR/L-13080-09 (0.4kg)
C4-SCLCR/L-17090-09/12 (0.5kg)
C4-SCLCR/L-27080-09 (0.7kg)

Cutting head for ID thread
CoroThread® 266
C4-266R/LKF-12060-16 (0.3kg)
C4-266R/LKF-14060-16 (0.4kg)
C4-266R/LKF-17070-16 (0.4kg)
C4-266RKF-22090-16 (0.7kg)
C4-R166.0KFZ12060-11 (0.3kg)

C4-266RKF-15065-22 (0.4kg)
C4-266RKF-19070-22 (0.4kg)
C4-266RKF-22090-22 (0.6kg)
C4-266RKF-27080-22 (0.8kg)

Head cartridge type boring bar (steel)
CoroTurn® SL
C4-570-2C 16 048 (0.4kg)
C4-570-2C 20 058 (0.4kg)
C4-570-2C 25 064 (0.5kg)
C4-570-2C 32 074 (0.6kg)
C4-570-2C 40 073 (0.8kg)
C4-570-2C 16 041R/L (0.4kg)
C4-570-2C 20 047R/L (0.4kg)

Head cartridge type boring bar
(vibration absorption)
CoroTurn® SL
C4-570-3C 16 088 (0.4kg)
C4-570-3C 20 107 (0.5kg)
C4-570-3C 25 132 (0.8kg)

Cutting head
CoroTurn® SL

Adapter for cylindrical shank with flat
C4-131-00040-10 (0.4kg)
C4-131-00045-12 (0.4kg)
C4-131-00050-16 (0.5kg)

Steel cutting tool for ID
φ6,8,10,12,16

Super U drill
CoroDrill® 880
880-DxxxxxC4-03/04
(φ12 ~ 30/3xDC ~ 4xDC)

Carbide cutting tool for ID
φ6,8,10,12,16

Turning Holder A
★AC4-BHB20R-100(CCW)
★AC4-BHB19.05R-100(CCW, inch)

Blank adapter for special application
C4-NR-040095-B (1.0kg)   C4-391.50-40 120-B (1.3kg)
C4-NR-060165-B (3.6kg)   C4-391.50-80 120-B (4.3kg)
C4-NR-080075-B (2.4kg)
C4-NR-100085-B (4.1kg)

Extension adapter
C4-391.01-40 060A (0.6kg)
C4-391.01-40 080A (0.7kg)
C4-391.01-40 040 (0.4kg)

Reduction adapter
C4-391.02-32 055A (C4⇒C3) (0.5kg)
C4-391.02-32 070A (C4⇒C3) (0.6kg)

Metric
Inch

Turret Head

24ST

A1021201-01
A1022201-01
Turning Holder(AL)
Forward

A1221201-01
A1222201-01
Turning Holder(AL)
Reverse

A1111201-01
A1112201-01
Cut-off Holder
Forward

A1311201-01
A1312201-01
Cut-off Holder
Reverse

A1061201-01
A1062201-01
Double Turning Holder

A1041202-01
A1042202-01
Turning Holder(B)

A1411253-01
A1412253-01
Boring Holder
(φ25)(φ25.4)

A1411253-12
A1412253-12
Boring Holder
(Coolant through)
(φ25)(φ25.4)

A1431254-01
A1432254-01
Double Boring Holder(B)
(φ25)(φ25.4)

A1091252-01
A1092252-01
Turning Boring Holder(AL)
(□16,φ25)(□15.875,φ25.4)

A1081164-01
A1082264-01
Quadruple Turning Holder(AL)
(□16)(□15.875)

C26330
Cross Holder
(Max.φ14)

H26333
Straight Holder
(Max.φ14)

Qualified Tool
□20×90
□19.05×90

Qualified Tool
□20×90
□19.05×90

N3170(φ25)
N3180(φ25.4)
Set Ring

M2112(φ25-φ12)
M2113(φ25-φ10)
M2122(φ25.4-φ12.7)
M2123(φ25.4-φ9.525)
Tool Holder

M2110(φ25-φ20)
M2111(φ25-φ16)
M2120(φ25.4-φ19.05)
M2121(φ25.4-φ15.875)
Round Hole Bush

W145102
W145103
Clamp piece

Qualified Tool
□16×80
□15.875×80

■ Capacity

Max. turning diameter (Tool spindle /Lower turret)	305mm / 220mm
Distance between spindles	max.1,000mm / min.230mm
Max. turning length	834mm
Bar capacity	φ51mm / φ65mm (op. only for L)
Chuck size	6" / 8"

■ Axis travel

Slide travel X1	585mm
Slide travel X2	130.5mm
Slide travel Z1	780+320(only during ATC)mm
Slide travel Z2	713mm
Slide travel Y1	±105mm
Slide travel B2	770mm

■ Left spindle

	φ51mm	φ65mm(op.)
Spindle speed	6,000min⁻¹	4,500min⁻¹
Spindle speed range	Stepless	Stepless
Spindle nose	A2-5	A2-6
Hole through spindle	63mm	80mm
I.D. of front bearing	100mm	120mm
Hole through draw tube	52mm	66mm

■ Right spindle

	φ51mm
Spindle speed	6,000min⁻¹
Spindle speed range	Stepless
Spindle nose	A2-5
Hole through spindle	63mm
I.D. of front bearing	100mm
Hole through draw tube	52mm

■ ATC Tool spindle

Tool spindle speed	12,000min⁻¹ , 20,000min⁻¹ (op.)
Swiveling range	190° （±95°）
Tool shank type	CAPTO C4 , HSK-T40 (op.)
Number of tools	36, (op. 48,72)
max. tool diameter / without adjacent tool	55mm / 80mm
max. tool length	180mm

■ 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 (12st) / □16mm (24st)
Tool size (round shank)	φ25mm

■ Milling (Lower turret)

Rotary system	Individual rotation
Milling spindle speed	6,000min-1 , 8,000min-1 (op. only for L φ65)
Spindle speed range	Stepless
Number of milling stations	12
Tool size	Straight holder φ1mm ∼φ14mm
	Cross holder φ1mm ∼φ14mm

■ Drive motor

L-spindle	11/7.5kW , 15/11kW (op.)
R-spindle	11/7.5kW
Tool Spindle	11/7.5kW
Milling (Lower turret)	7.1/2.2kW, 6/1.5kW (op.)

■ General

Height	2,662mm (ATC 36)
	2,858mm (ATC 48/72)
Floor space (L × W)	4,350mm ×2,795mm
Machine weight (incl. control)	14,000kg (ATC 36)
	14,800kg (ATC 48)
	15,100kg (ATC 72)

■ Power requirements

power supply	45.1kVA (49.1kVA) (L spindle 11/7.5kW)
	48.2kVA (52.2kVA) (L spindle 15/11kW op.)

●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.)

②In 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, expanding 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.

◦ Machine warranty terms are void for any claims or damage arising from the use of inappropriate cutting fluids or lubricating oils.

■ Items

Control type	FANUC 31i-B (2-PATH)

■ Controlled axes

Controlled axes	9 axes
Least command increment	Upper：5axes (X1, Z1, C1 (C2) , Y1, B1 axis) Lower：4axes (X2, Z2, C2 (C1) , B2 axis)

■ Input command

Least input increment	X,Z,Y,B2：0.001mm/0.0001inch (diameter for X-axis),) , C,B1：0.001°
Least command increment	X：0.0005mm / Z,Y,B2：0.001mm / C,B1：0.001°
Max.programmable dimension	±999999.999mm / ±39370.0787in , ±999999.999°
Absolute / incremental programming	X, Z, Y, C, B (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, Z： 1 ∼ 8000mm/min, 0.01 ∼ 315inch/min (1 ∼ 4800mm/min, 0.01 ∼ 188inch/min) Y： 1 ∼ 8000mm/min, 0.01 ∼ 315inch/min (1 ∼ 4800mm/min 0.01 ∼ 188inch/min) C： 1 ∼ 4800° /min B1： 1 ∼ 8000° /min (1 ∼ 4800° /min) B2： 1 ∼ 8000mm/min, 0.01 ∼ 315inch/min (1 ∼ 4800mm/min 0.01 ∼ 188inch/min) feed / rev 0.0001 ∼ 8000.0000mm/rev (0.0001 ∼ 4800.0000mm/rev) 0.000001 ∼ 50.000000inch/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
Handle feed	Manual pulse generator 0.001/0.01/0.1mm,° (per pulse)
Automatic acceleration / decelaration	Standard
Linear accel./ decel. After cutting feed interpolation	Standard
Rapid feed override	Low /25/50/100% (changeable to every 10% by NT Setting screen)
Cutting feedrate override	0 ∼ 150%, 10% (each 10%)
AI contouring control I	G5.1
L- Spindle override	50%∼ 120% Set every 10%
R-Spindle override	50%∼ 120% Set every 10%
Tool Spindle override	50%∼ 120% Set every 10%

■ Program memory

Part program storage length	1Mbyte Total 2560m (Upper/ Lower：Each 1280m) 2Mbyte Total 5120m (op.) 4Mbyte Total 10240m (op.) 8Mbyte Total 20480m (op.)
Part program editing	delete, insert, change
Program number search	Standard
Sequence number search	Standard
Address search	Standard
Number of registerable programs	Total 2,000 programs (Upper/ Lower：Each 1,000 programs) Total 4,000 programs (op.)
Program storage memory	Backed up by battery
Multiple program simultaneous 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 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
Sub program	Standard
Custom macro	Standard (common variable#100 - #149, #500 - #549)
Additional customer macro variables	Standard (After addition, #100 - #199, #500 - #999)
Luck-bei Ⅱ / NT Manual Guide i	Standard
Abnormal load detection function	Standard
NT Work Navigator	Standard (not including contact bar)
NT NURSE	Standard

■ Mechanical support

Rigid tap	Standard
Spindle synchronised control	Standard
C axis synchronised control	Standard (G496 C1, fast forward positioning)
Spindle orientation	Standard
Tool spindle orientation	Standard : 4 positions (90° × 4/ M785/ M786/ M787/ M788)
	Maximum : 12 positions (30° × 12/ G419)

■ ECO function

Servo motor power off	Standard (changeable by NT Setting screen)
Motor acceleration / deceleration output limit	Standard (changeable by NT Setting screen
Servo motor energy saving acceleration / deceleration G code	G356/G357
Automatic lighting off	Standard (changeable by NT Setting screen)
Automatic monitor off	Standard (changeable by NT Setting screen)

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