# JX-200

## Change the IMPOSSIBLE to POSSIBLE

Innovative
Technology
～Creating new values～

# JX-200

Ultra-modern 6 to 8-inch chuck multitasking machine with a tool spindle and a lower turret equipped with a standard Y-axis.
Featuring "NT Smart Cube", the shortest tool spindle in its class, the machining area can be used effectively, thus covering a wide range of machining needs. Additionally, a full range of Nakamura-Tome user-friendly software is available.

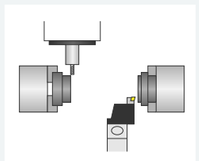
| | | | | |
|---|---|---|---|---|
| S×2 Twin Spindle | M×2 Milling Motor | B1 Tool Spindle | A ATC | TR R-Lower Turret |
| C×2 C-axes | Y×2 Y-axes | B2 R spindle | | |



## Change the IMPOSSIBLE to POSSIBLE

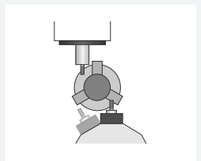
The world's shortest tool spindle in its class "NT Smart Cube" allows for a more effective use of its large machining area. By combining Lower turret, various machining operations can be supported, such as simultaneous machining with L/R spindles, simultaneous machining with Upper and Lower turrets, and center support on Lower turret.

With the ability to handle a workpiece covering the entire volume zone, and a flexible unit configuration that enables any type of processing. These are examples of the various processes that can be done by this machine:



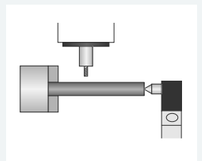
### Flexible machining with L/R spindles

Flexible machining with L/R spindles to reduce the cycle time.



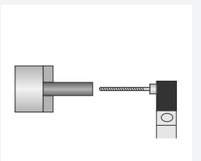
### Simultaneous Y-axis vertical machining

Wide variety of milling operations, thanks to its Y-axis travel of ± 105mm on the tool spindle and ± 35mm on the lower turret.



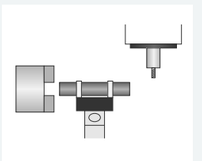
### Turret Center-support

The center support on the Lower turret is ideal for long workpieces.



### Long drill machining

Enables the use of long drills that do not fit in the ATC magazine.



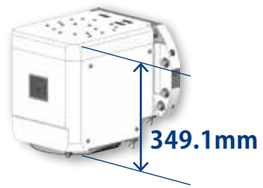
### Semi-automatic

Loading/unloading workpieces by the work rest on the turret.

## The world's shortest tool spindle in its class※
# NT Smart Cube

■ Tool Spindle (NT Smart Cube)

| | |
|---|---|
| Length | 349.1mm* |
| * The length is 428.6mm in case the tool spindle speed is 18,000min$^{-1}$ | |
| Y-axis slide travel | ±105mm |
| Tool spindle motor | 15/11kW<br>12,000min$^{-1}$<br>18,000min$^{-1}$ (op.) |




■ L-spindle

Standard

| | |
|---|---|
| Bar capacity | Φ65mm |
| L-spindle motor | 15/11kW<br>4,500min$^{-1}$ |

Option

| | |
|---|---|
| Bar capacity | Φ80mm* |
| L-spindle motor | 18.5/15kW<br>3,500min$^{-1}$ |

* Specification of Φ51mm bar capacity is not available on R-spindle when Φ80mm bar capacity is selected on L-spindle.

■ R-spindle

Standard

| | |
|---|---|
| Bar capacity | Φ51mm |
| R-spindle motor | 11/7.5kW<br>6,000min$^{-1}$ |

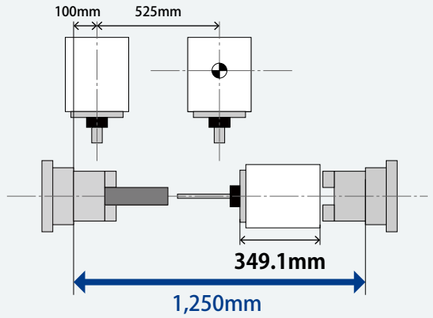
Option

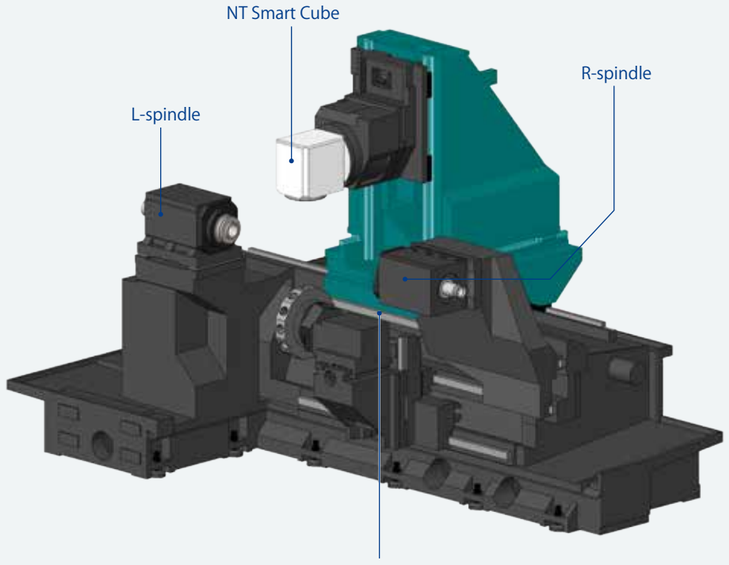
| | |
|---|---|
| Bar capacity | Φ65mm |
| R-spindle motor | 15/11kW<br>4,500min$^{-1}$ |

## Large machining area

The world's shortest tool spindle in its class.
Thanks to the ultra-compact size of the Tool Spindle, interference is reduced, and a wider machining area is ensured.

* Based on our survey in the multitasking machine market

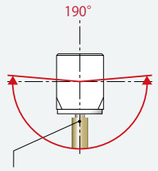



Stable and rigid structure with less vibration

## 144 tools
## Up to 144 tools available!

In addition to 120 ATC tools(op.) for the Tool Spindle, 24 tools (half index) can be mounted on the Lower Turret.




Max.tool diameter /
Without adjacent tool：
φ90 / φ130mm

Max.tool length：300mm

## ATC Maintenance Navigator

In addition to 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.

ATC
80（op. 40,120）

NT SmartX


## High accuracy milling

Thanks to its large Y-axis travel and 50mm X-axis travel below the spindle center, various machining operations can be performed without rotating the C-axis, such as square milling in the X-Y plane, ensuring faster cycle time and higher recision.

■ R-lower turret

| | |
|---|---|
| Y-axis slide travel | ±35mm |
| Milling motor | 5.5/3.7kW<br>6,000min$^{-1}$<br>8,000min$^{-1}$ (op.) |

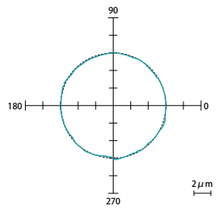
Parts catcher type G

| | | Φ65 | Φ80 |
|---|---|---|---|
| Workpiece size | Diameter (mm) | Φ12~65 | Φ31~80 |
| | Length (mm) | 15~150 | |
| | Weight (kg) | 3.0 | |
| Ejecting method | | Belt conveyor & Chute | |

## Stable and High Precision ATC multitasking machine

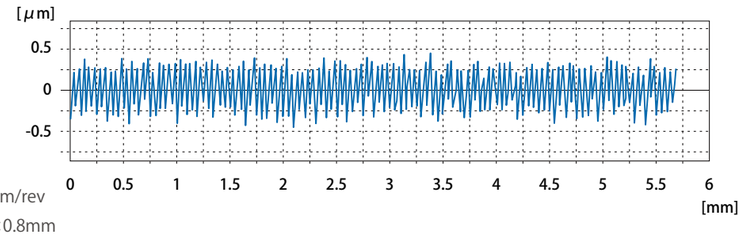
■ Roundness
**0.36 μm**

- Spindle speed: 4,000min$^{-1}$
- Material: BsBM(JIS)



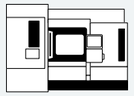

■ Surface roughness (Rmax)
**0.91 μm**

- Spindle speed: 4,500min$^{-1}$
- Feed: 0.05mm/rev
- Material: BsBM(JIS)
- Nose R: 0.8mm



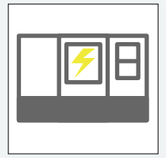

| | L-spindle | R-spindle |
|---|---|---|
| ■ Spindle motor | 15/11kW<br>18.5/15kW(op. ) | 11/7.5kW<br>15/11kW(op. ) |
| ■ Spindle speed | 4,500min$^{-1}$<br>3,500min$^{-1}$(op.) | 6,000min$^{-1}$<br>4,500min$^{-1}$(op.) |
| Turning (Tool spindle) | | |
| Common cutting condition | | |
| ■ Cutting cross section | 3.6mm$^2$ | 2.65mm$^2$ |
| ■ Material S45C<br>■ Cutting speed 120m/min | ■ Depth of cut 6mm<br>■ Feed 0.6mm/rev | ■ Depth of cut 5mm<br>■ Feed 0.53mm/rev |
| ■ Cutting speed 100m/min | ■ Groove width 8mm<br>■ Feed 0.1mm/rev | ■ Groove width 5mm<br>■ Feed 0.1mm/rev |

* The actual measured values shown in this catalog are for reference only and may differ depending on cutting conditions and specifications.



**Initiatives in our products**

Addition of eco-mode function to NT SmartX software
Improvement of power control system

Cut down power consumption by approx.68%

* When ECO mode is enabled

Inverter-Driven Hydraulic Power Unit


Cut down power consumption by approx.45%

* Compared with Super NTJX on standby mode

Reduction of oil consumption by changing from oil to grease lubricating

Cut down lubricating oil consumption by approx.98%

* Compared with Super NTJX

Switching the power source is expected to reduce annual $CO_2$ emissions by approximately 6,563 tons. (* 1)

**Cedar trees**

**Approx. 468,000 pcs** * 2

**$CO_2$ reduction**

(* 1) Actual values from April 2019 to March 2020
(* 2) Each cedar tree absorbs 14 kg of CO2 per year. (Source: Forestry Agency)

**Nakamura-Tome is committed to the environment as an eco-friendly manufacturer.**

# NT SmartX

## Full Operator Support: from Ease of Use to Reliability

### Main features of NT SmartX

| Standard | |
|---|---|
| • NT Work Navigator | • Drop Converter |
| • Airbag (Overload detection) | • Cut in check |
| • NT Nurse function | • Program Optimizer |
| • Status Display Function | • NT Machine Simulation |
| • Setup Display | • NT Collision Guard |
| • Trouble Guidance | • NT Thermo Navigator AI |
| • Productivity Function | • Digital Chuck interlock |
| • Warm up Function | • NT Manual Guide i |
| • Smart Support | • One Touch MDI |
| | • 3D Smart Pro AI |

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


Nakamura-Tome AI

■ Powered by AI as standard equipment

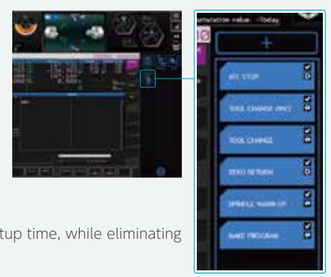
- NT Thermo Navigator AI
- 3D Smart Pro AI

### Digital Chuck Interlock

**Set the Chuck Open and Close 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 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

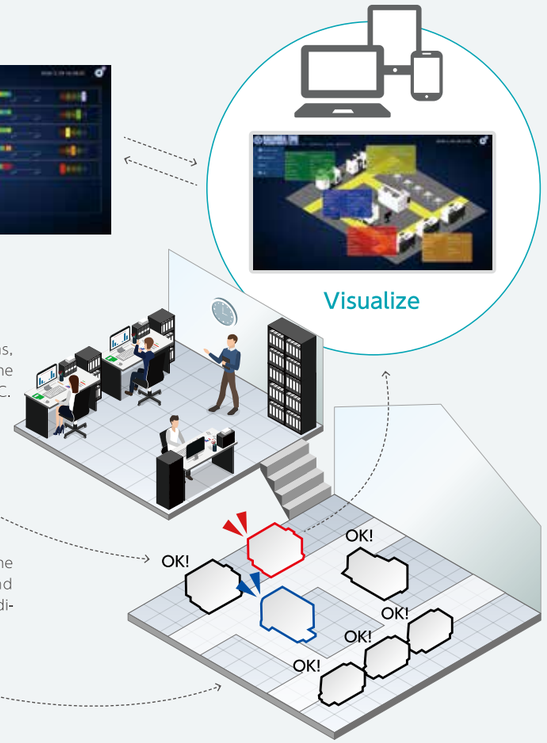
Real Time Monitoring of machine running conditions, in addition to visualizing alarm history and past events.

■ 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.

① Time
② Measured Dimensions
③ Retrieval of Wear Offset Data

Acquired Data analyzed with NT Thermo Navigator AI

Feedback

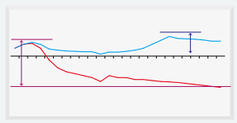
Standard for NT Smart X

### 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.

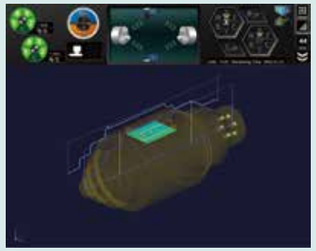


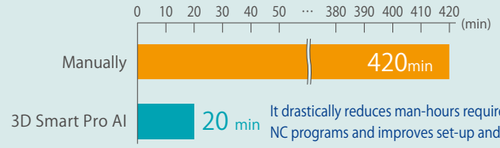
— Pre-correction thermal displacement data
— Thermal displacement data after correction

# 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.






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

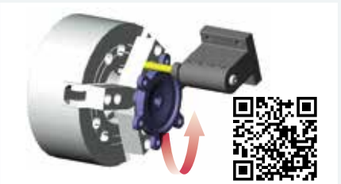
Once the tolerance value is input, the target value for machining can be set.

## NT Work Navigator

X Y Z B C

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 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.



▲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" to prevent a 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.

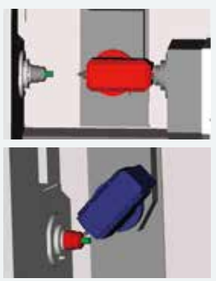


Image shown here is of a Tool spindle machine

## 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 confident: Airbag !

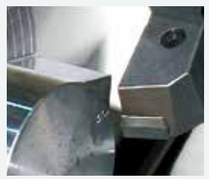
**When the machine collides, there is no reason to panic.**

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

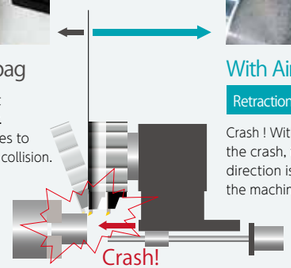
Machines will not stop immediately. The slide continues to move even after a collision.



With Airbag

Retraction within 0.001 sec

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

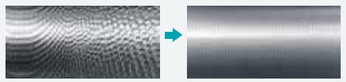



▲Video

* This feature does not mean zero impact

## Chatter Canceller

Reduce the chatter and vibration by changing spindle speed up/down continuously during cutting.Function can be turn ON/OFF simply by M code.



OFF ON

* It does not warrant that the function works without chatter and vibration.
* Chatter and vibration may not be reduced depends on setting up as well as cutting condition.

## Oscillation cutting (op.)

By oscillating the tool for a certain period, the chips are cut into small pieces. It can be activated easily by using simple Fanuc G-code and resolve workpiece damage issues caused by chips twined around the part.

Material : Aluminum
Cutting speed : 200mm/min
Cutting depth : 1.0mm
Cutting feed : 0.1mm/rev

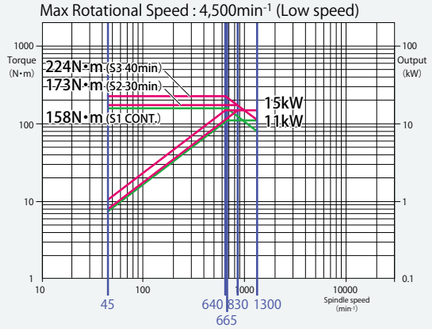
## Torque / Output Chart

### L-spindle motor

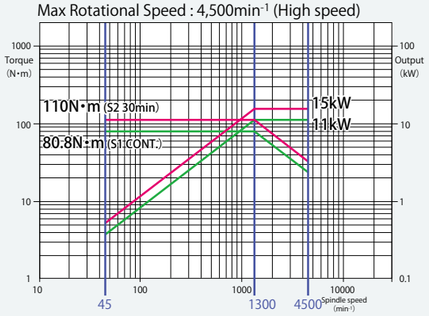
Bar capacity
Φ65mm
15/11kW

Standard

Max Rotational Speed : 4,500min$^{-1}$ (Low speed)




Max Rotational Speed : 4,500min$^{-1}$ (High speed)

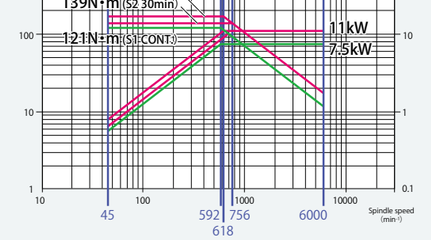



### R-spindle motor

Bar capacity
Φ51mm
11/7.5kW

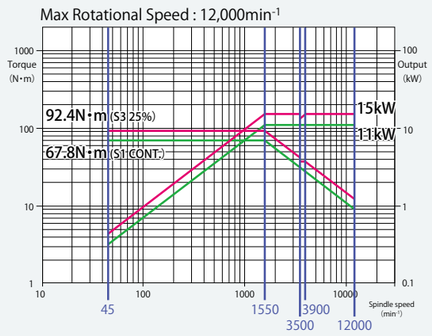
Standard

Max Rotational Speed : 6,000min$^{-1}$



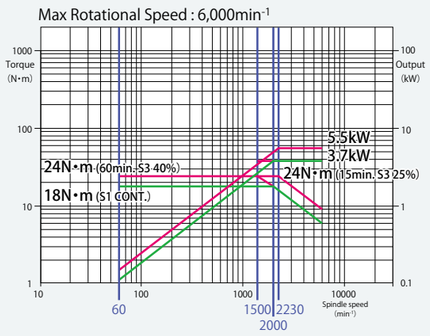

### Tool spindle motor　Standard

Max Rotational Speed : 12,000min$^{-1}$




### Milling motor　Standard

Max Rotational Speed : 6,000min$^{-1}$




## Tooling System

Metric
Inch

Turret Head

24ST

- B1011202-01 / B1012202-01 Turning Holder(A) CW
- B1211202-01 / B1212202-01 Turning Holder(A) CCW
- B1111202-01 / B1112202-01 Cut-off Holder CW
- B1311202-01 / B1312202-01 Cut-off Holder CCW

→ Qualified Tool □20×95 □19.05×95

- B1021201-01 / B1022201-01 Turning Holder(AL) CW
- B1221201-01 / B1222201-01 Turning Holder(AL) CCW
- B1031201-01 / B1032201-01 Turning Holder(AS)

→ Qualified Tool □20×125 □19.05×125

- B1021252-01 / B1022252-01 Turning Holder(AL) CW
- B1221252-01 / B1222252-01 Turning Holder(AL) CCW
- B1031251-01 / B1032251-01 Turning Holder(AS)
- B1061251-01 / B1062251-01 Double Turning Holder(ALD)

→ Qualified Tool □25×150 □25.4×150

- B1041201-01 / B1042201-01 Turning Holder(B)

→ Qualified Tool □20×125 □19.05×125

- B1041251-01 / B1042251-01 Turning Holder(B)

→ Qualified Tool □25×150 □25.4×150

- B1081201-01 / B1082201-01 Quadruple Turning Holder (AL) (□20)(□25.4)

→ R145102 / R145103 Clamp piece → Qualified Tool □20×95 □19.05×95

- B1101252-01 / B1102252-01 Turning Boring Holder (AL) (□20, φ25)(φ25.4)
- B1431252-01 / B1432252-01 Double Boring Holder (B) (φ25)(φ25.4)
- B1411252-01 / B1412252-01 Boring Holder (φ25)(φ25.4)
- B1411252-12 / B1412252-12 Boring Holder (Coolant through) (φ25)(φ25.4)

→ N3170(φ25) / N3180(φ25.4) Set Ring → M2112(φ25-φ12) / M2113(φ25-φ10) / M2508(φ25-φ8) / M2506(φ25-φ6) / 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 Bushing

→ Z1910(φ25-φ20) / Z1911(φ25-φ16) / Z1920(φ25.4-φ19.05) / Z1921(φ25.4-φ15.875) Reduction bush

- B1411322-01 / B1412322-01 Boring Holder (φ32)(φ31.75)
- B1411322-12 / B1412322-12 Boring Holder (Coolant through) (φ32)(φ31.75)

→ N3171(φ32) / N3181(φ31.75) Set Ring → HS134(φ32-φ16) / HS133(φ32-φ12) / HS132(φ32-φ10) / HS131(φ32-φ8) / HS130(φ32-φ6) / M2682(φ31.75-φ12.7) / M2688(φ31.75-φ9.525) Tool Holder

→ N1154(φ32-φ25) / N1152(φ32-φ20) / N1160(φ31.75-φ25) Round Hole Bushing

→ AC1310 Cross Holder (MAX.φ16)

→ AG1393 Straight Holder (MAX.φ16)

# Tooling System

## Sandvik Coromant Capto C6

★Alps tool type AS・AC

φ50-100 Milling cutter

**Face milling adapter**
C6-391.05C-22 025M (0.9kg)
C6-391.05C-27 025M (1.0kg)
C6-391.05C-32 025M (1.1kg)

φ50-100 Side cutter

**Side cutter arbor**
C6-391.10-27 030 (1.1kg)
C6-391.10-32 025 (1.1kg)

End mill

Chamfering cutter

Drill

Drill with oil hole

Reamer

Straight collet

393.CG-20xx52 (φ3-16 Without shields)
393.CG-25xx56 (φ3-20 Without shields
393.CG-32xx60 (φ6-25 Without shields)
393.CGS-20xx52 (φ3-18 With shields)
393.CGS-25xx56 (φ3-20 With shields)
393.CGS-32xx60 (φ8-25 With shields)

**Hydro chuck adapter (CoroChuck® 930) For heavy cutting**
930-C6-HD-20-084 (1.7kg)
930-C6-HD-25-087 (2.1kg)
930-C6-HD-32-091 (2.6kg)

**Slim type**
930-C6-S-12-082 (1.2kg)
930-C6-S-20-091 (1.4kg)
930-C6-S-25-098 (1.7kg)

**Pencil type**
930-C6-P-06-091 (0.9kg)
930-C6-P-12-107 (1.0kg)
930-C6-P-12-142 (1.1kg)
930-C6-P-12-192 (1.4kg)
930-C6-P-20-155 (1.6kg)

Straight collet

★AS 16-d (φ6-12)
★AS 20-d (φ6-16)
★ASS 20-d (φ6-16 Including adjust bolts)

**Milling chuck adapter**
★AC6-TRX16-70 (1.2kg)
★AC6-TRX20-75 (1.4kg)
★AC6-TRX25-80 (1.7kg)
★AC6-TRX32-90 (2.4kg)
★AC6-TRX40-100 (3.5kg)

ER/AR collet

393.14-16/20/25/32d (φ1-20)
393.15-16/20/25/32d (φ3-20 With shields)
※Commercially available ER/AR collets can be used instead.

**Collet chuck adapter**
C6-391.14-20 060 (0.8kg)
C6-391.14-25 060 (0.9kg)
C6-391.14-32 060 (0.9kg)
C6-391.14-40 065 (1.2kg)

Tap

Tap (with coolant hole)

Tap collet

393.14-20 DxxxXxxx (M3-M14)
393.14-25 DxxxXxxx (M5-M20)
393.14-20 DxxxXxxx (M20-M22)
※Commercially available ER/AR collets can be used instead.

**Tap adapter**
(CoroChuck® 970)
970-C6-20-105 (1.2kg)
970-C6-25-124 (1.6kg)
970-C6-40-154 (2.8kg)

End mill

CORO MILL 390

**Weldon shank adapter**
C6-391.20-20 065 (1.5kg)
C6-391.20-25 080 (1.9kg)
C6-391.20-32 090 (2.4kg)

Delta Drill

Coromant U drill

**ISO9766 shank adapter**
C6-391.27-16 070 (1.1kg)
C6-391.27-20 070 (1.1kg)
C6-391.27-25 070A (1.1kg)
C6-391.27-32 070 (1.3kg)
C6-391.27-40 085 (1.7kg)

**Extension adapter**
C6-391.01-63 100A (2.3kg)
C6-391.01-63 140A (3.3kg)
C6-391.01-63 185 (3.8kg)
C6-391.01-62 060
(1.3kg short type / Bolt type not possible.)

**Reduction adapter**
C6-391.02-32 070A (1.1kg) (C6⇒C3)
C6-391.02-32 185 (2.8kg) (C6⇒C3)
C6-391.02-40 080A (1.3kg) (C6⇒C4)
C6-391.02-40 185 (3.0kg) (C6⇒C4)
C6-391.02-50 080A (1.5kg) (C6⇒C5)
C6-391.02-50 110 (2.2kg) (C6⇒C5)

**Cutting head "CoroTurn® Prime" for OD Face turning**
C6-CP-30AR/L-45065-11C (1.3kg)
C6-CP-25BR/L-45065-11B (1.3kg)

**CORO TURN® RC**
C6-DCLNR/L-45065-12/16/19 (1.3kg)
C6-PCLNR/L-45065-12HP/16HP/19HP (1.3kg)
C6-DDJNR/L-45065-1504 (1.1kg)
C6-PDJNR/L-45065-1504HP (1.2kg)
C6-SCLNR/L-45065-09/12 (1.1kg)
C6-SCLNR/L-45065-12HPA (1.2kg)
C6-SDJCR/L-45065-11 (1.1kg)
C6-SDJCR/L-45065-11HPA (1.2kg)

**Cutting head for grooving / cut off turning**
**CORO CUT® 1・2**
C6-R/LF123G10-45065B (3.0kg)
C6-R/LF123H13-45065B (4.0kg)
C6-R/LF123J13-45065B (4.0kg)
C6-R/LF123K16-45065B (5.2kg)
C6-R/LF123L16-45065B (5.5kg)

**Cutting head for OD thread**
C6-266R/LFG-45065-16/22/27 (1.3kg)

**Cutting head for ID boring**
C6-DCLNR/L-27240-12/-27140-16 (0.9/1.7kg)
C6-PCLNR/L-27240-12HP/-27140-12HP (1.0/1.7kg)
C6-DDUNR/L-27140-15 (1.7kg)
C6-DDUNR/L-27140-15HP (1.7kg)

**Cutting head for ID thread**
C6-266R/LKF-14070-16 (1.0kg)
C6-266R/LKF-17075-16 (1.0kg)
C6-266R/LKF-22090-16 (1.2kg)
C6-266R/LKF-27105-16 (1.6kg)

**Head cartridge type boring bar (steel)**
C6-570-2C 16 056 (0.9kg)
C6-570-2C 20 068 (1.0kg)
C6-570-2C 25 082 (1.0kg)
C6-570-2C 32 081 (1.2kg)
C6-570-2C 40 092 (1.5kg)
C6-570-2C 40 105 (2.4kg)

**Head cartridge type boring bar (vibration absorption)**
C6-570-3C 16 088 (1.0kg)
C6-570-3C 20 108 (1.0kg)
C6-570-3C 25 230 (1.7kg)
C6-570-3C 32 224 (2.1kg)
C6-570-3C 40 198 (2.6kg)
C6-570-3C 50 239 (4.2kg)

**Cutting head**
R/L 570 type

**Adapter for cylindrical shank with flat**
C6-131-00098-25 (2.4kg)
C6-131-00112-40 (3.5kg)

**Sleeve**
132N-25xx (φ6,8,10,16,20)
132N-40xx (φ20,25,32)

**Steel cutting tool for ID**

**Carbide cutting tool for ID**
ExxX-STFCR/L xx-R

**Rectangular shank adapter (type B)**
A C6-ASHR/L-105-20HP (2.3kg)
C6-ASHR/L-122-25HP (2.9kg)
B C6-ASHA-070-20HP (1.8kg)

**MDI adapter (*MDI = Modular Drilling Interface)**
C6-DM20-N-033 (1.0kg)
C6-DM25-N-030 (1.0kg)
C6-DM32-N-030 (1.0kg)
C6-DM40-N-040 (1.4kg)

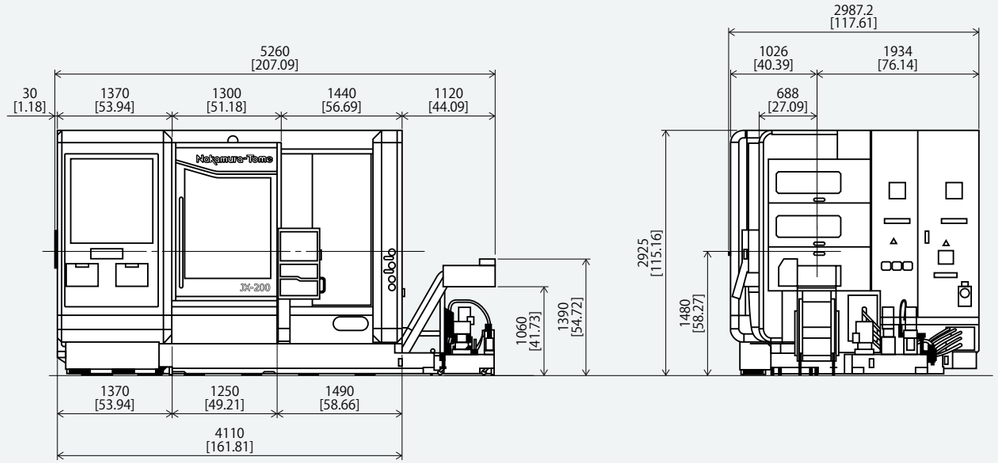
**CoroDrill® DS20**
DS20-DxxxxDMxx-xx (φ15-40, MDI sixe, L/D 04 OR 07)

**Extension adapter**
C6-391.01-63 100A (2.3kg)
C6-391.01-63 140A (3.3kg)
C6-391.01-63 185 (3.8kg)
C6-391.01-62 060 (1.3kg short type / Bolt type not possible.)

**Reduction adapter**
C6-391.02-32 070A (1.1kg)(C6⇒C3)
C6-391.02-32 185 (2.8kg)(C6⇒C3)
C6-391.02-40 080A (1.3kg)(C6⇒C4)
C6-391.02-40 185 (3.0kg)(C6⇒C4)
C6-391.02-50 080A (1.5kg)(C6⇒C5)
C6-391.02-50 110 (2.2kg)(C6⇒C5)

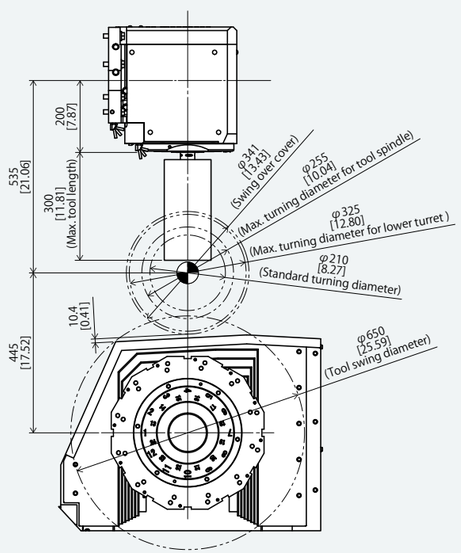
* For details, refer to the Sandvik Coromant Tooling Catalog.

## Machine Dimensions

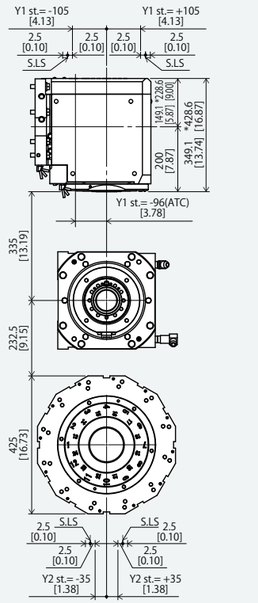


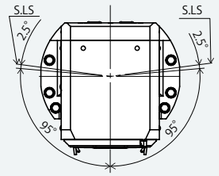

mm[inch]

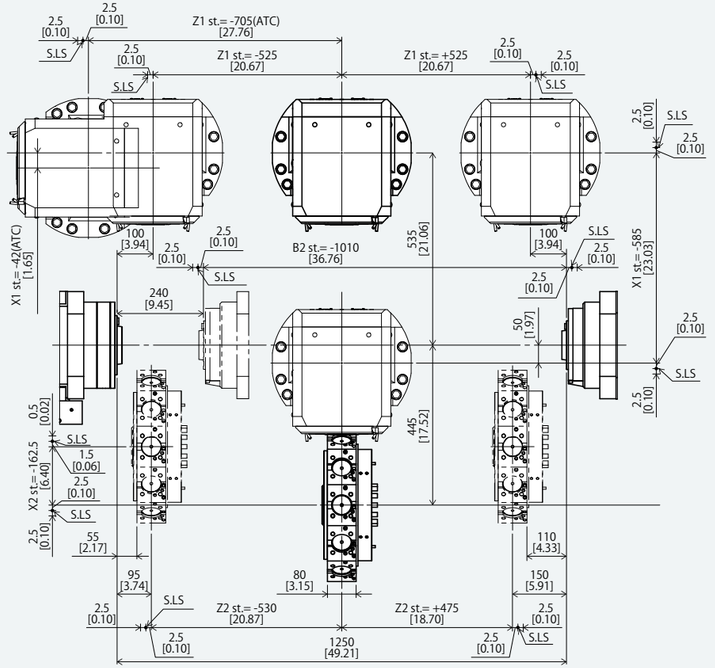
## Maximum Tool Diameter




## Travel Range




mm[inch]

## ■ Capacity

| | φ51 | φ65 | φ80* |
|---|---|---|---|
| Max. turning diameter (Tool spindle / Lower turret) | 325mm / 255mm | | |
| Distance between spindles | max.1,250mm / min.240mm | | |
| Max. turning length | 1,058mm | | |
| Bar capacity | φ51mm | φ65mm | φ80mm |
| Chuck size | 6" / 8" | | |

## ■ Axis travel

| | |
|---|---|
| X1-Axis slide travel | 585mm |
| X2-Axis slide travel | 162.5mm |
| Z1-Axis slide travel | 1,050mm (at ATC+180mm) |
| Z2-Axis slide travel | 1,005mm |
| Y1-Axis slide travel | ±105mm |
| Y2-Axis slide travel | ±35mm |
| B2-Axis slide travel | 1,010mm |

## ■ Rapid feed

| | |
|---|---|
| X1-Axis rapid feed rate | 30m/min |
| X2-Axis rapid feed rate | 16m/min |
| Z1-Axis rapid feed rate | 40m/min |
| Z2-Axis rapid feed rate | 40m/min |
| Y1-Axis rapid feed rate | 16m/min |
| Y2-Axis rapid feed rate | 6m/min |
| B2-Axis rapid feed rate | 40m/min |

## ■ L-spindle

| | | φ65 | φ80(op.)* |
|---|---|---|---|
| Spindle speed | - | 4,500min$^{-1}$ | 3,500min$^{-1}$ |
| Spindle speed range | - | Stepless | Stepless |
| Spindle nose | - | A2-6 | A2-8 |
| Hole through spindle | - | 80mm | 90mm |
| I.D. of front bearing | - | 120mm | 130mm |
| Hole through draw tube | - | 66mm | 81mm |

## ■ R-spindle

| | φ51 | φ65(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 | - |

* Specification of φ51mm bar capacity is not available on R-spindle when φ80mm bar capacity is selected on L-spindle.

### ●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 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.

## ■ ATC Tool spindle

| | |
|---|---|
| Tool spindle speed | 12,000min$^{-1}$ / 18,000min$^{-1}$ (op.) |
| Swiveling range | 190° ( ±95° ) |
| Tool coupling type | CAPTO C6 / HSK-T63(op.) |
| Number of tools | 80, (40, 120 op.) |
| Max. tool diameter / Without adjacent tool | 90mm / 130mm |
| Max. tool length | 300mm |

## ■ 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) | □25mm |
| Tool size (round shank) | φ32mm |

## ■ Milling

| | | |
|---|---|---|
| Rotary system | Individual rotation | |
| Milling spindle speed | 6,000min$^{-1}$ / 8,000min$^{-1}$(op.) | |
| Spindle speed range | Stepless | |
| Number of milling stations | 12 | |
| Tool size | Straight holder | φ1mm ～φ16mm |
| | Cross holder | φ1mm ～φ16mm |

## ■ Drive motor

| | φ51 | φ65 | φ80* |
|---|---|---|---|
| L-spindle | - | 15/11kW | 18.5/15kW(op.) |
| R-spindle | 11/7.5kW | 15/11kW(op.) | - |
| Tool Spindle | 15/11kW | | |
| Milling (Lower turret) | 5.5/3.7kW | | |

## ■ General

| | | |
|---|---|---|
| Height | | 2,925mm |
| Floor space (L x W) | | 5,250mm ×2,987.2mm |
| Machine weight (incl. control) | ATC 80 | 23,000kg |
| | ATC 40(op.) | 22,500kg |
| | ATC 120(op.) | 24,000kg |

## ■ Power requirements

| | |
|---|---|
| Power supply | 59.5kVA(63.5kVA) (L-spindle 15/11kW, R-spindle 11/7.5kW) |
| | 62.5kVA(66.5kVA) (L-spindle 15/11kW, R-spindle 15/11kW) |
| | 66.1kVA(70.1kVA) (L-spindle 18.5/15kW, R-spindle 15/11kW) |

### ●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.

## ■ Items

| | |
|---|---|
| Control Type | FANUC 31i-B5 Plus(2-PATH) |

## ■ Controlled axes

| | | |
|---|---|---|
| Controlled axes | 10 axes | |
| Simultaneously Controlled axes | Upper | 5 axes(X1, Z1, C1(C2), Y1, B1 axis) |
| | Lower | 5 axes(X2, Z2, C2(C1), Y2. 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 B) / U, W, V, H |
| Decimal input | Standard |
| Inch / Metric conversion | G20 / G21 |
| Programmable data input | G10 |

## ■ Feed function

| | |
|---|---|
| Cutting feed | feed/min<br>X, Z： 1～8000mm/min, 0.01～315inch/min (1～4800mm/min, 0.01～188inch/min)<br>Y1： 1～8000mm/min, 0.01～315inch/min (1～4800mm/min, 0.01～188inch/min)<br>Y2： 1～6000mm/min, 0.01～236inch/min (1～4800mm/min, 0.01～188inch/min)<br>C： 1～4800°/min<br>B1： 1～8000° /min (1～4800° /min)<br>B2： 1～8000mm/min, 0.01～315inch/min (1～4800mm/min, 0.01～188inch/min)<br>feed / rev 0.0001～8000.0000mm/rev (0.0001～4800.0000mm/rev) 0.000001～50.000000inch/rev<br>The maximum cutting feed rate is the value in AI contour control mode. In normal operation, It is enabled with G316 command. The values in parentheses are normal values. |
| Dwell | 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 / 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%, 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 / Number of registrable programs | 4Mbyte Total 10240m | 4000 |
| | 8Mbyte Total 20480m(op.) | |
| 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

| | |
|---|---|
| HMI (Human Machine Interface) | NT SmartX |
| Operation panel : Display | 19-inch color SXGA LCD touch panel |
| Operation panel : Keyboard | QWERTY keyboard |

## ■ Programming assist functions

| | |
|---|---|
| Circular interpolation R programming | Standard |
| Direct drawing dimension programming or Chamfering/Corner R | Standard (Direct drawing dimension programming is standard) |
| 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 |
| Custom macro | Standard (common variables #100 - #149, #500 - #549) |
| Additional custom 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 |

## ■ Machine support functions

| | |
|---|---|
| Rigid tapping | Standard |
| Spindle synchronized control | Standard |
| C axis synchronized control | Standard(G496 C1. rapid feed positioning) |
| Spindle orientation | Standard |
| Tool spindle orientation | Standard：4 positions (4×90° )(M785/M786/M787/M788) |
| | Maximum：12 positions(12×30° )(G419) |

## ■ 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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