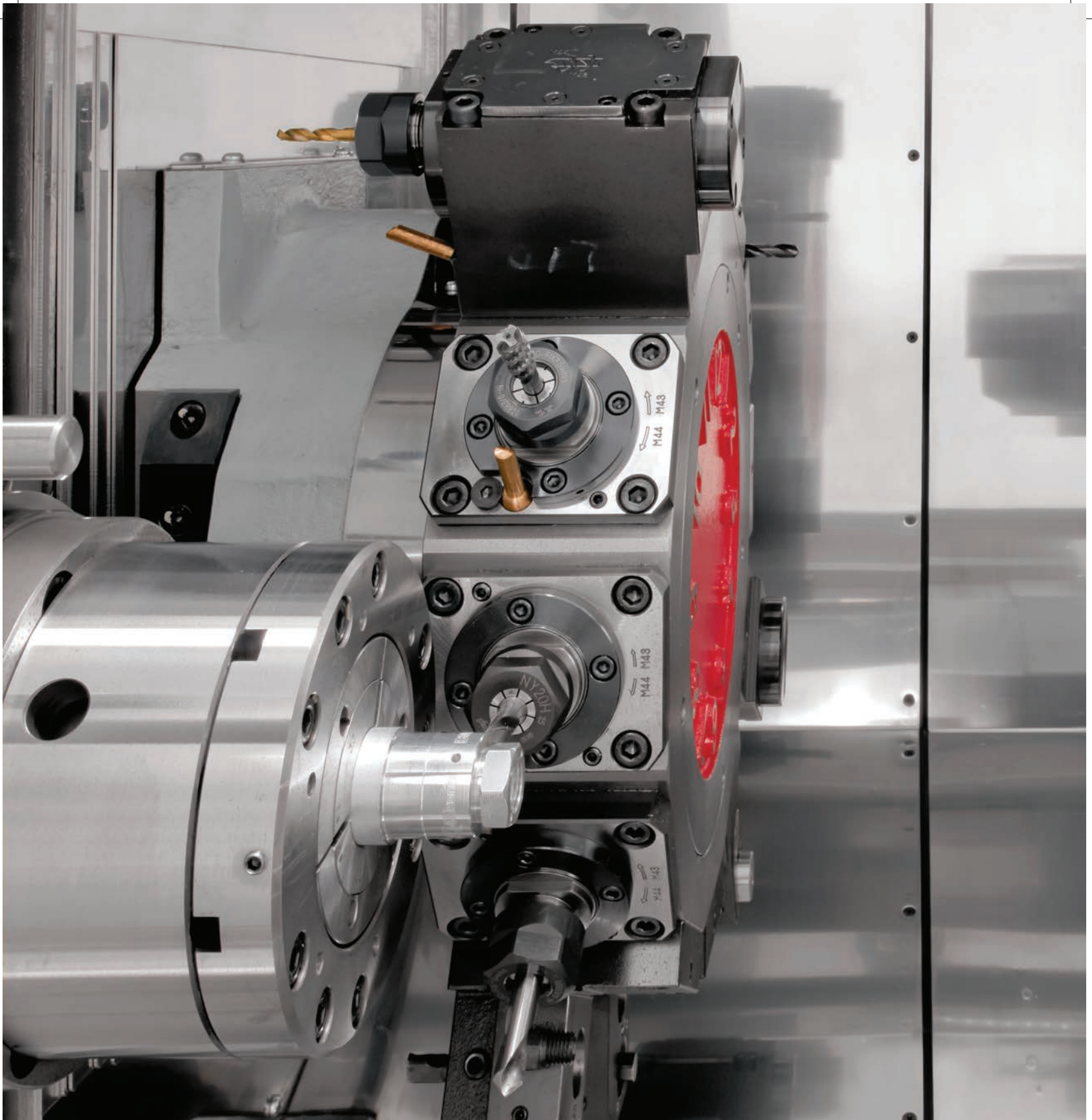# Miyano

BNJ51

Fixed Headstock Type CNC Automatic Lathe

Turret No. 2 now has 8 tool mounting stations in place of the 6 on the previous machines, so the number of tools has increased and optional revolving tools can also be mounted.

The milling processes that were handled using turret No. 1 can now be shared with turret No. 2, making it possible to substantially shorten cycle times and deal with workpieces that require complex machining.
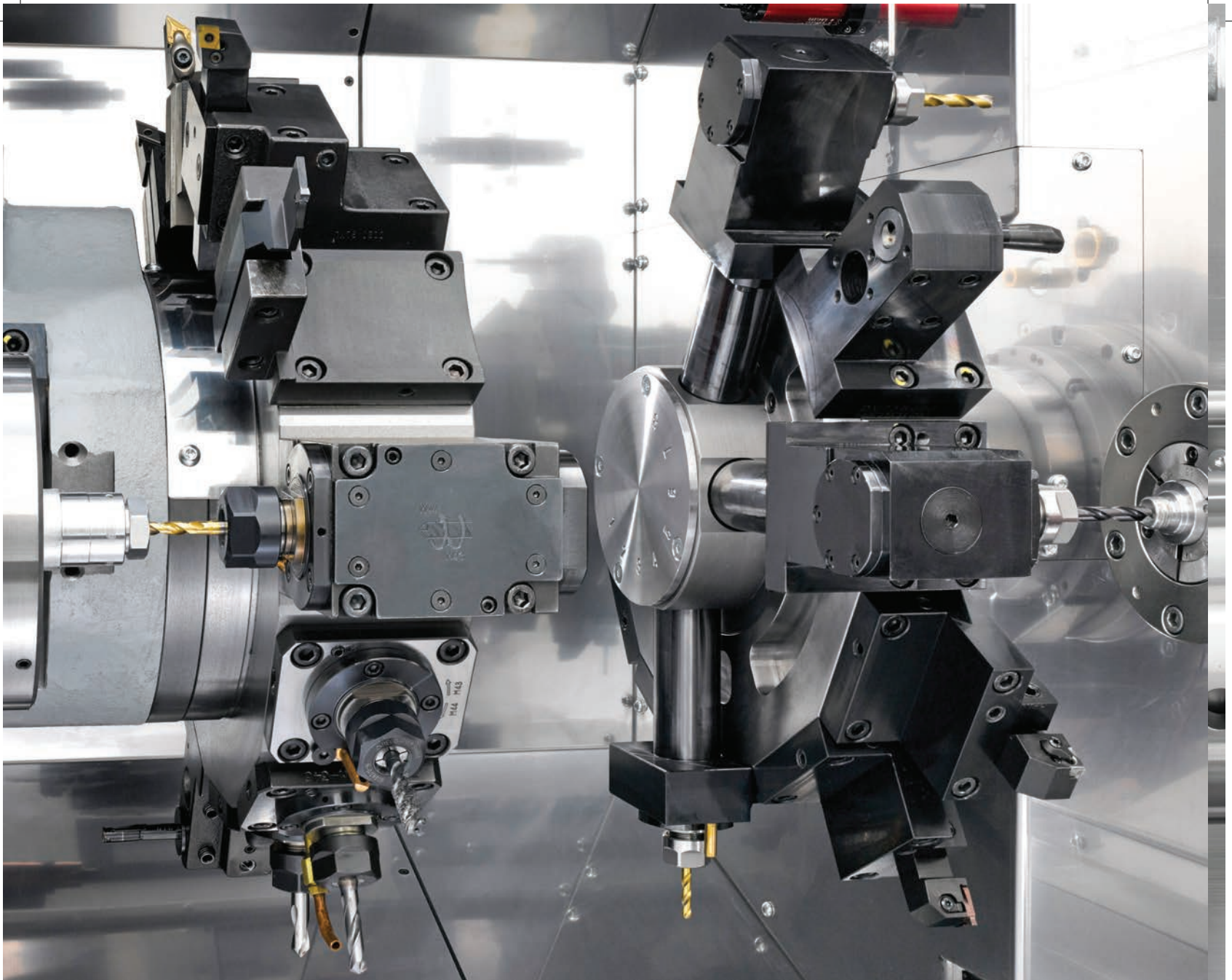
### Turret No. 1 Accommodating Higher-torque Revolving Tools

Since a single drive mechanism is used to drive the revolving tools, they can be mounted at all stations. With a maximum torque of 25 Nm, they can handle heavy-duty cutting as well.

Turret No. 2 Now With a Bigger Tool Capacity and Ability to Accommodate Optional Revolving Tools

The number of tool mounting positions has increased from the six on existing machines to eight. The turret also now accepts double plain holders, greatly increasing the number of tools that can be mounted.

Machining Time Shortened by Simultaneous Machining at Left and Right

High efficiency is assured by having turret No. 1 and 2 machine simultaneously at left and right at spindles 1 and 2.
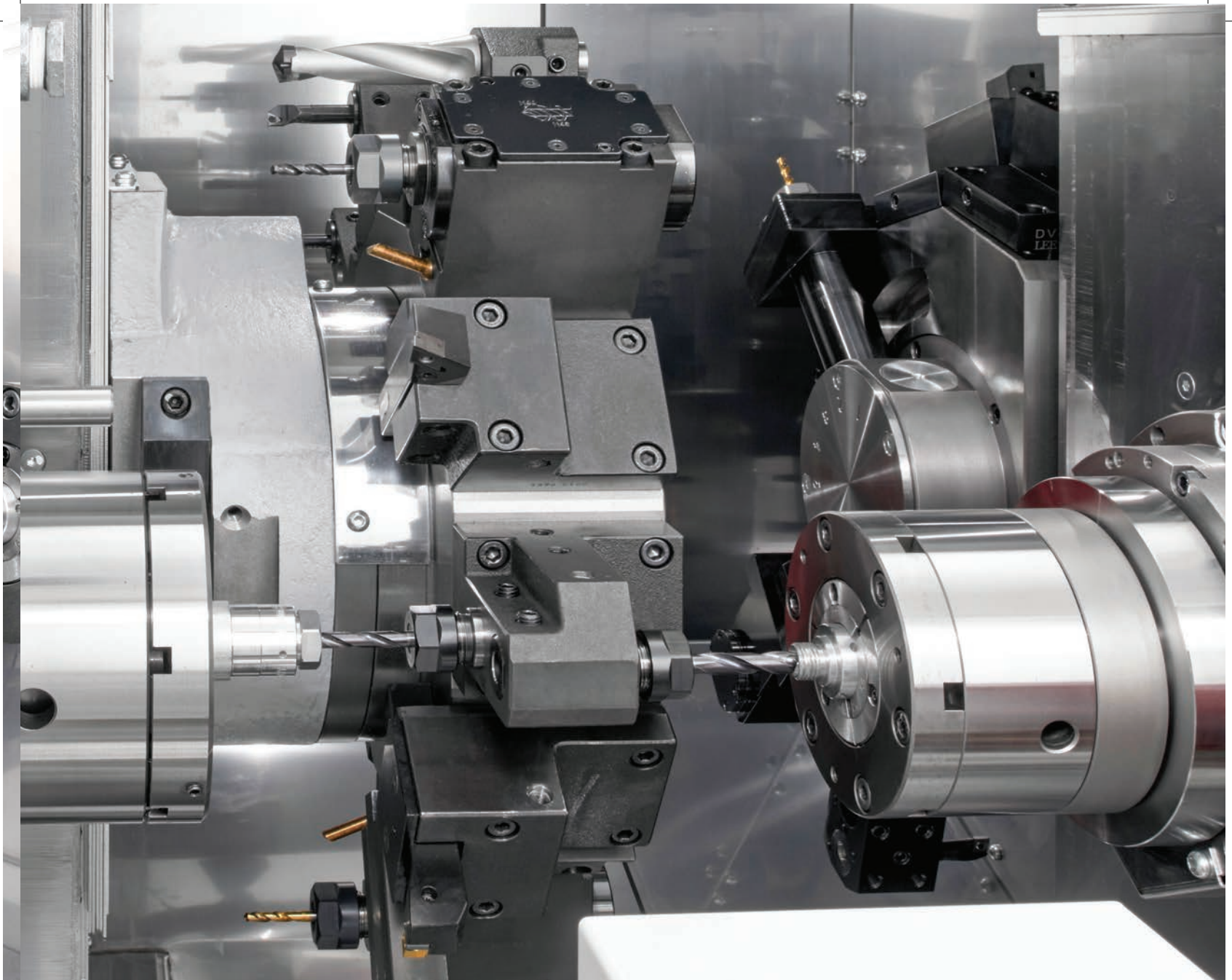
Combined Machining with the Y-axis

The SY type can handle the machining of complex shapes using the main turret's Y axis function.

Machining Time Shortened through Superimposition Machining

Superimposition control, where the move commands of turret No. 2 that can move in the X and Z directions are overlapped on the movement of turret No. 1, thus achieving substantial reductions in machining time.

Basic Construction

Turret No. 1
Type of turret: 12 Station
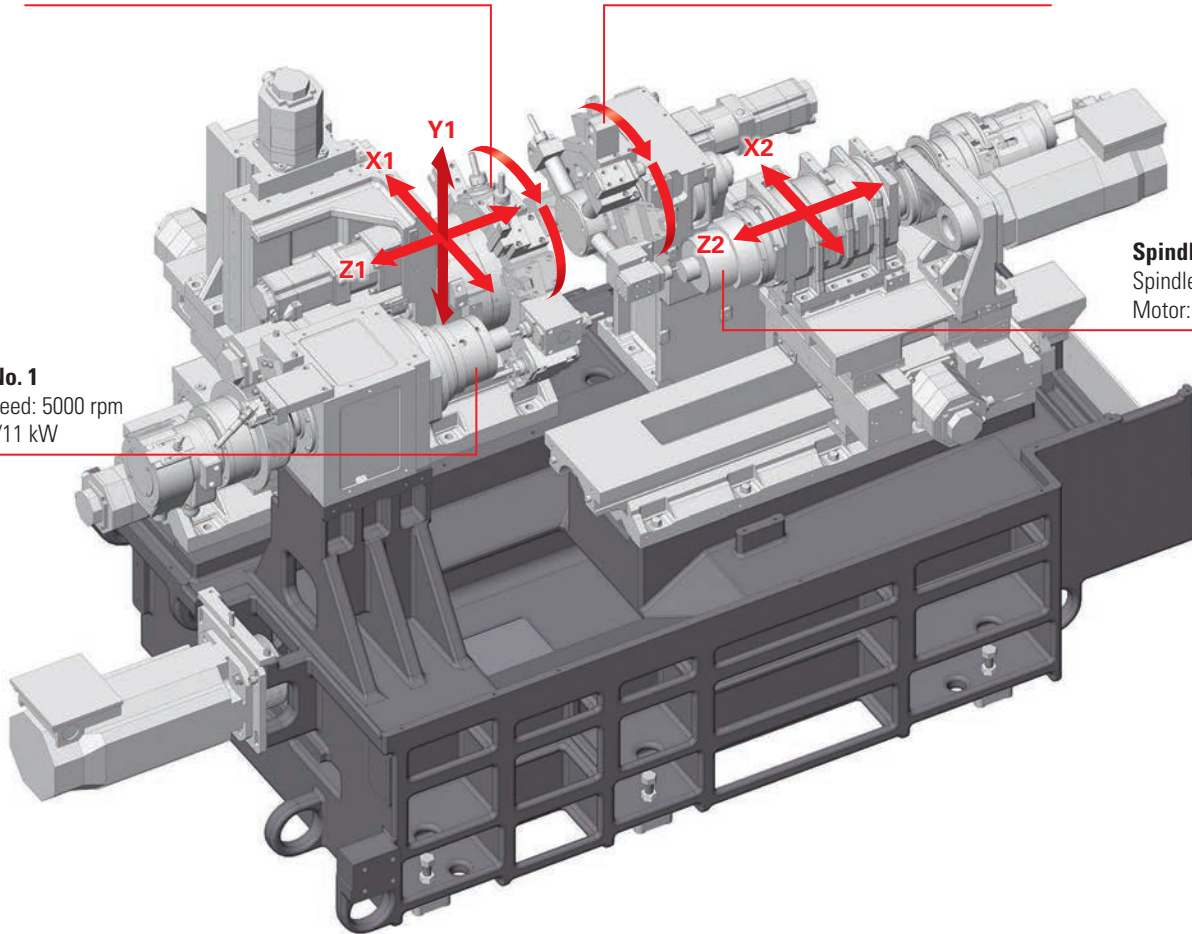Number of revolving tools mountable: 12 (25 Nm)

Turret No. 2
Type of turret: 8 Station
Number of revolving tools mountable: 4 (10 Nm)

Y1
X1
Z1
X2
Z2
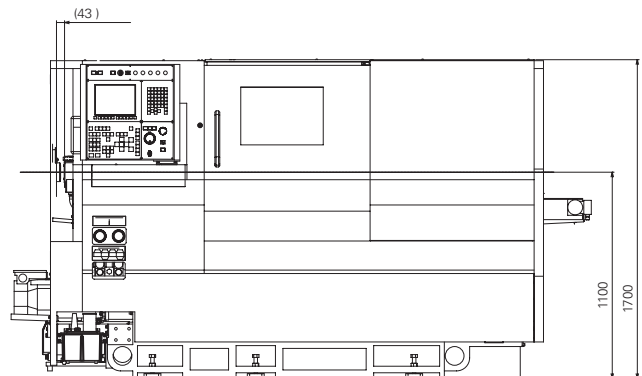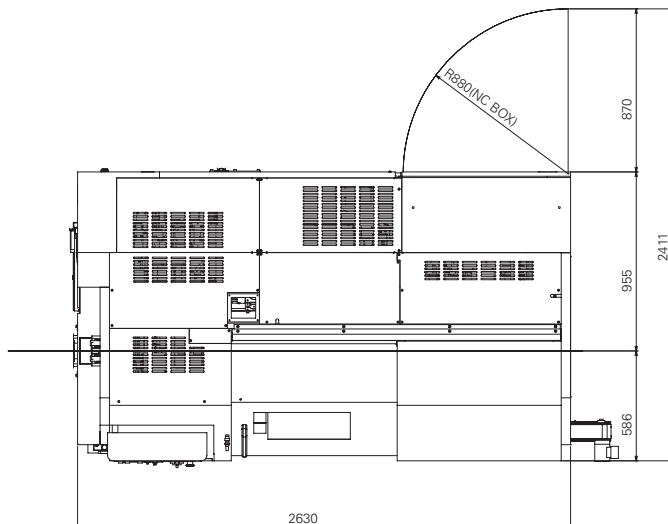
Spindle No. 2
Spindle speed: 5000 rpm
Motor: 7.5/5.5 kW

Spindle No. 1
Spindle speed: 5000 rpm
Motor: 15/11 kW

External View

R880(NC BOX)

870
955
586
2411
2630

(43)
1100
1700

High Rigidity Spindle and Higher Torque Revolving Tools

The BNJ-51 has further increased the rigidity of spindle 1 by adopting the combination of angular contact ball bearings and double-row cylindrical roller bearings at the front, and double-row cylindrical roller bearings at the rear.

Assembling and inspecting these spindles based on a strict management system gives them ample rigidity and suppression of abnormal heat output, and manageable thermal displacement characteristics, thus facilitating high-precision machining.

In addition, the use of rigid 25 Nm revolving tools on turret No. 1 achieves stable milling.

Revolving Tool Torque Diagram
Turret No.1
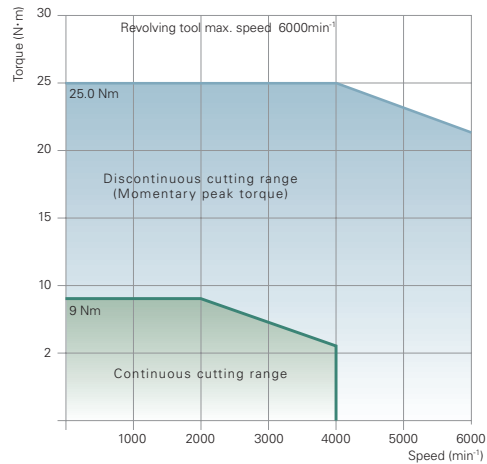
Revolving Tool Torque Diagram
Turret No.2
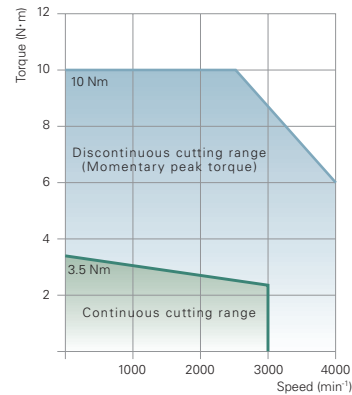
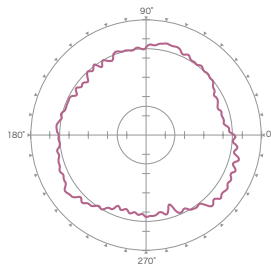# Machining Accuracy

Test piece

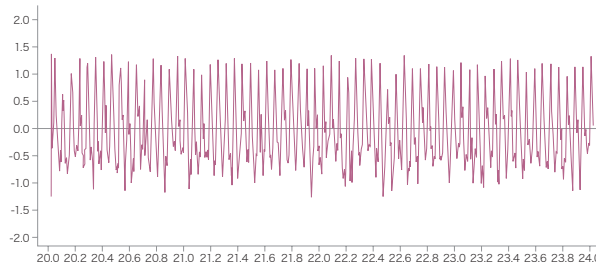|	
Material:	BSBM (Brass)
Spindle speed:	3,000 rpm
Feed:	0.06 mm/rev
Depth of cut:	0.5 mm (in diameter), 0.25 mm (in radius)
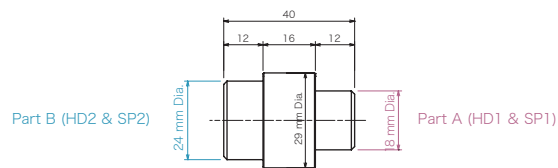
Roundness (part A)
0.66μm
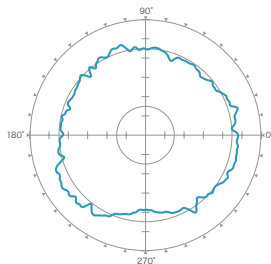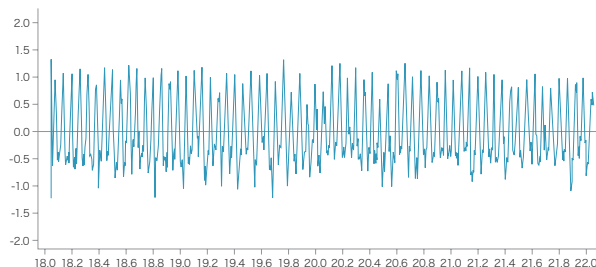

Surface roughness (part A)
Rz 2.5468μm

Roundness (part B)
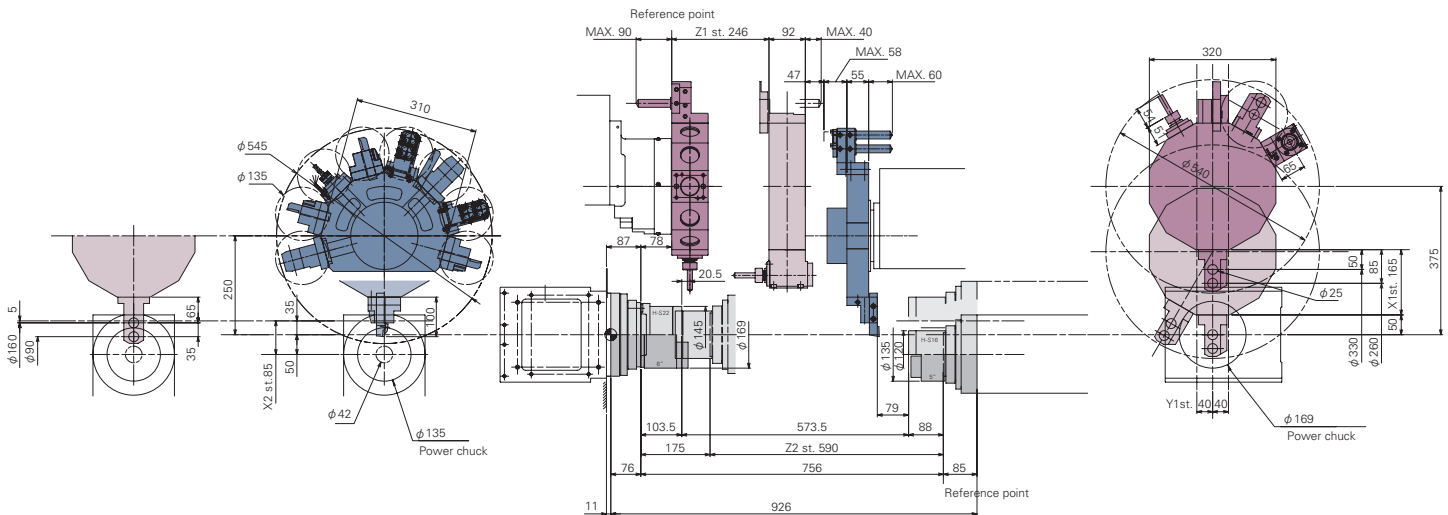0.62μm

Surface roughness (part A)
Rz 2.3419μm

This data does not guarantee accuracy

Tooling System

Cutt off tool holder R
□ 3/4"

Cutt off tool holder L
□ 3/4"

Double turning holder B
□ 3/4"

Double turning holder
□ 3/4"

Turning holder A
□ 3/4"

Turning holder B
□ 3/4"

Turning holder C
□ 3/4"

Turning tool

Cut off tool holder B

Cut off tool holder
□ 3/4"

Double & turning holder F
ø1" □ 3/4"

Double & turning holde R
ø1" □ 3/4"

Turning & plane holder
ø1" □ 3/4"

Double plane head A
ø1"

Double plane head B
(Oil hole specification)
ø1"

Double plane head B
ø1"

Y Double plane head A
(Oil hole specification)
ø1"

12 st. Turret

Collet holder — Tapping collet — Tap

Collet holder

Chuck collet
- Center drill
- Straight shank drill
- Straight shank reamer
- Boring tool

Round hole bush

Drill holder — Drill bush
- Straight drill
- Center drill

X Spindle unit

Z Spindle unit

Nut NA20
- Chuck collet
  - Straight shank drill
  - Center drill
  - End mill
- Tapping collet
- Tapping collet — Tap

X Spindle unit

Z Spindle unit

Nut NA25
- Chuck collet
  - Center drill
  - Straight shank drill
  - End mill
- Tapping collet — Tap

Z Double spindle unit

Nut NA11 — Chuck collet

Nut NA20 — Chuck collet
- Straight drill
- Center drill
- End mill

Tapping collet — Tap

Z Double spindle unit

Nut
- Chuck collet
  - Straight drill
  - Center drill
- Chuck collet
  - End mill
- Tapping collet — Tap

Z Spindle unit

Nut

Chuck collet
- Straight shank drill
- Center drill
- End mill

Tapping collet

Tapping collet — Tap

Collet holder Tapping collet Tap

X Spindle unit

Collet holder Chuck collet
- Center drill
- Straight shank drill
- Straight shank reamer
- Boring tool

Round hole bush

Turning holder
□ 3/4" — Turning tool

Double plane head
(Oil hole specification)
ø1"

Drill holder Drill bush 20
- Straight drill
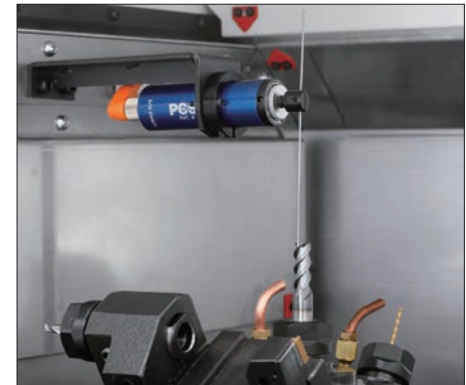- Center drill

8 st. Turret

Tooling Area

Accessories

Part catcher (standard)
The part catcher and part conveyor are indispensable for bar work.

Part conveyor (standard)

Drill breakage detector (option)
Drill breakage is detected by the swing cylinder. The machine stops when breakage is detected, and a second accident can be prevented.
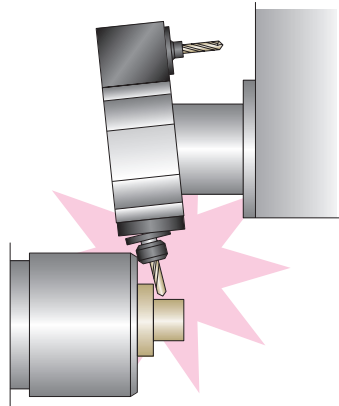

Chip conveyor (standard)
This unit ejects chips smoothly and is indispensable for protracted, unmanned operation.

Collision Buffering

When interference is encountered in rapid traverse operation, the function decelerates and stops axis feed and generates retraction torque to retract the feed axis in the opposite direction to the collision direction, limiting damage to the machine.

Without the collision buffering function

With the collision buffering function

* This function does not serve to prevent collisions.
* It is only enabled for rapid traverse commands, and is disabled in cutting feed, etc.
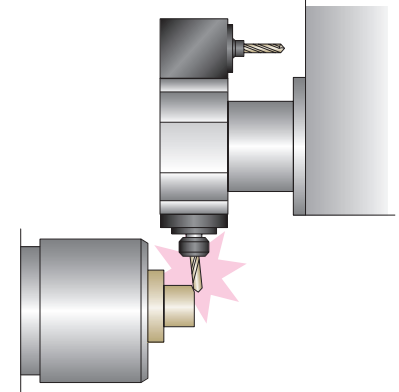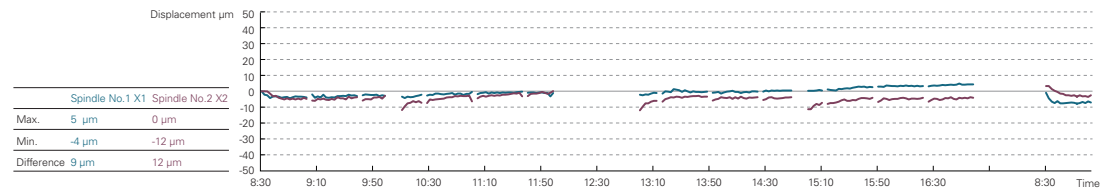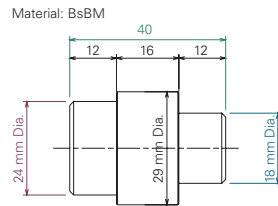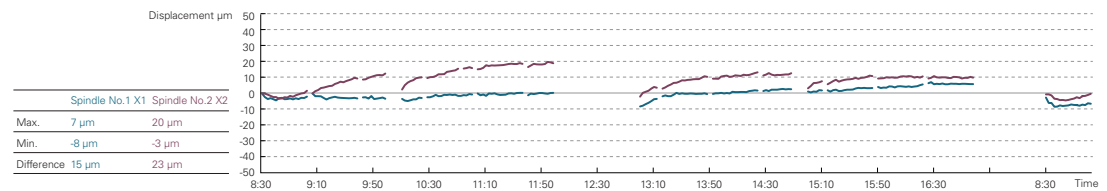
Thermo Revision

The sensors installed inside this thermal displacement correction system measures the temperature of each part of the machine and corrects the thermal displacements on the X-axis and Z-axis by inputting coefficients prepared for oil-based and water soluble coolants.

Material: BsBM

40
12 16 12
24 mm Dia.
29 mm Dia.
18 mm Dia.

Continuous cutting of brass No revolving tool operation (Thermo revision compensation ON)

	Spindle No.1 X1	Spindle No.2 X2
Max.	5 µm	0 µm
Min.	-4 µm	-12 µm
Difference	9 µm	12 µm

Continuous cutting of brass No revolving tool operation (Thermo revision compensation ON) Duty13%

	Spindle No.1 X1	Spindle No.2 X2
Max.	7 µm	20 µm
Min.	-8 µm	-3 µm
Difference	15 µm	23 µm

Environmental Information

Basic Information	Energy usage	Power supply voltage	AC200V
		Electrical power requirement (Max)	33KVA
		Required pneumatic pressure	0.5MPa
Environmental Performance Information	Power consumption	Standby power[1]	4.843kW
		Power consumption with model workpiece[2]	0.0798 kWh/cycle[3]
		Power consumption value above converted to a CO2 value[4]	37.8 g/cycle
	Air consumption	Required air flow rate	max90Nl/min: during air blow
	Lubricant consumption	At power ON	6cc/15min
	Noise level	Value measured based on JIS	78dB
	Environmental load reduction	RoHS Directive / REACH regulations	Compliant
Approach to Environmental Issues	Recycling	Indication of the material names of plastic parts	Covered in the instruction manual[5]
	Environmental management		We are ISO14001 accredited. We pursue "Green Procurement", whereby we make our purchases while prioritizing goods and services that show consideration for the environment.

1. This is the standby power in the idle stop mode (a function that turns servomotor excitation off when it is not necessary, for example during program editing).
2. This is the power consumption in program operation (when not cutting) for one of our standard test pieces, shown for the purpose of comparing the environmental performance with that of existing models.
3. The average cycle time is 112.856 sec with the standard test workpiece of our company.
4. This is the value converted in accordance with the CHUBU Electric Power CO2 emissions coefficient for 2009 as published by the Ministry of the Environment.
5. If polyvinyl chloride (PVC) and fluoric resin are not processed correctly they can generate harmful gases. When recycling these materials, commission a contractor that is capable of processing them appropriately.

User Friendly Design for Ease of Operation

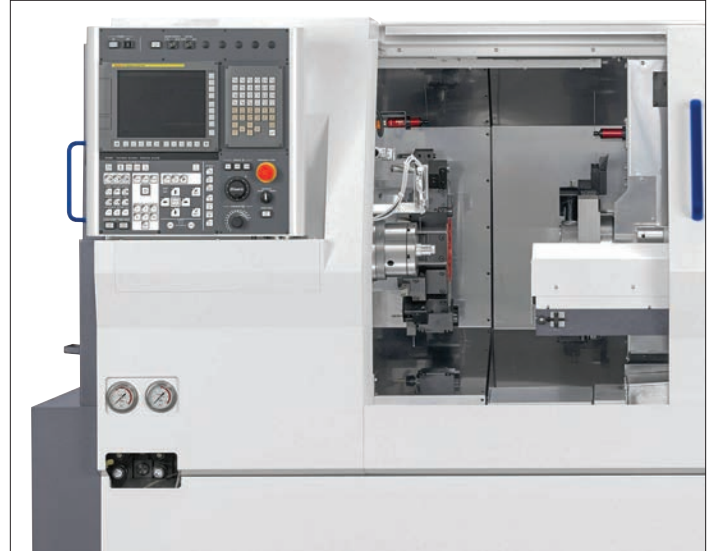The operation panel that was at the top of the previous machines has been moved to the left side of the new SY6. Operating convenience has been improved by lowering the position of the operation switches. The generous door opening also improves access to the machining area, lightening the load on the operator.

Previous tooling area

New BNJ-51SY6 tooling area

Machining Support Screens Provide Improved Working Efficiency

Menu screen
Displays the list of custom screens

Tool counters
Used to set and reset the tool counter stop value and enter the tool wear offsets.

Cycle time display
Measures the cutting time, non-cutting time and running time in each cycle.

Machining data
Entering the machining length and position of the cut-off here makes it easier to measure geometry offsets and to mount tools.

Tool setting
Used to measure geometry offsets. It can also be used for tool mounting support, to ensure that the overhang of all tools is fixed at a constant value.

Tool monitor
Allows you to monitor tool wear and breakage by checking the current state of the machining and status of the cutting tools in terms of numerical values based on the sampling data.

Machine Specifications

Model		BNJ-51SY6
Maximum machining length		100 mm
Diameter of standard cutting	Spindle No. 1	51 mm Dia.
	Spindle No. 2	42 mm Dia.
Chuck size	Spindle No. 1	6 inch
	Spindle No. 2	5 inch
Number of spindles		2
Spindle speed range	Spindle No. 1 & 2	5,000 rpm
Inner diameter of draw tube	Spindle No. 1	52 mm Dia.
	Spindle No. 2	43 mm Dia.
Collet chuck	Spindle No. 1	H-S22
	Spindle No. 2	H-S16, DIN171E
Power chuck	Spindle No. 1	6" thru-hole chuck
	Spindle No. 2	5" thru-hole chuck
Number of turrets		2
Type of turret	Turret No. 1	12 station turret
	Turret No. 2	8 station turret
Shank height of square turning tool		3/4" Sq.
Diameter of drill shank		1" Dia.
Revolving tools		
Number of revolving tool	Turret No. 1	Max. 12
	Turret No. 2	Max. 4
Type of revolving tool	Turret No. 1	Single clutch
	Turret No. 2	Simultaneous drive in all positions
Tool spindle speed range	Turret No. 1	6,000 rpm
	Turret No. 2	3,000 rpm
Machining capacity Drill	Turret No. 1	Max. 13 mm Dia.
	Turret No. 2	Max. 10 mm Dia.
Tap	Turret No. 1	Max. M12 × 1.75 (S45C-D)
	Turret No. 2	Max. M6 × 1.0 (S45C-D)
Turret slide stroke	X1 axis	165 mm
	Z1 axis	246 mm
	Y1 axis	80 (± 40) mm
Spindle slide stroke	X2 axis	85 mm
	Z2 axis	590 mm
Rapid feed rate	X1, Z1, X2, Z2 axes	20 m/min
	Y1 axis	12 m/min
Motors		
Spindle drive	Spindle No. 1 Cs	15/ 11 kw (15 min/cont.)
	Spindle No. 2 Cs	7.5/ 5.5 kw (15 min/cont.)
Revolving tool drive	Turret No. 1	2.2 kw
	Turret No. 2	0.75 kw
Slide		1.2 kw (X1, Z1, Y, X2, Z2)
Hydraulic oil motor		2.2 kw
Lubricating oil motor		0.004 kw
Coolant pump		0.25 kw × 1, 0.18 kw × 1
Turret index motor		0.75 kw
Power supply		
Voltage		AC 200/ 220 ±10% 50/ 60 Hz ±1%
Capacity		33 KVA
Air supply		0.5 MPa
Fuse		100 A
Hydraulic oil tank capacity		10 L
Lubricating oil tank capacity		4 L
Coolant tank capacity		300 L
Machine height		1,700 mm
Floor space		2,630 × 1,540 mm (without chip conveyor)
Machine weight		11,687 lbs

NC Device	Fanuc FS 0i-TF
Controlled axis	Simultaneously controlled axis Max.4
	X1, Z1, Y1, Cs1, A1, A2, X2, Z2, Cs2
Min. input increment	0.001 mm, 0.0001 inch, 0.001 deg
Min. output increment	X axis: 0.0005 mm, Z axis: 0.001 mm
	Y axis: 0.001 mm
Parts program strage capacity	Total 1MB (2,560m Tape length)
Spindle function	Spindle speed S4-digits
	Constant Cutting speed control (G96)
Rapid traverse rate	X1, X2, Z1 axis: 20 m/min
	Z2 axis: 20 m/min
	Y1 axis: 12 m/min
Cutting feed rate	F 3.4 digit per revolution
Cutting feed rate override	0-150% (in 10% increments)
Interpolation	G01, G02, G03
Threading	G32, G92
Canned cycle	G90, G92, G94
Work coordinate setting	Automatic Setting, 64 work coordinate setting by the tool position
Tool selection	by TAABB at the specified position for each turret tool wear compensation is selected by BB.
Direct input of tool position	by measured MDI
Input/ Output interface	USB, PC Card slot
Automatic operation	1 cycle operation/ Continuous operation, Single block
	Block delete, Machine lock, Dry run, feed hold
	Optional block skip

NC standard functions
10.4" color LCD
No of resistered programs: 800
Decimal point input
Manual pulse generator
Memory protect
Polar coordinate interpolation
Programable data input (G10)
C-axis control (SP1/SP2)
Superimposed control A
Chamferring/ Corner R
Tool nose R compensation
Background editing
Synchronous mixed control
Operating time/ Parts No. display
Multiple repetitive canned cycle (G70-G76)
Continuous threading
Canned cycle for drilling
Tool life management system
Variable-lead cutting
Rigid tap function (Spindle & Revolving tool)
Circular interpolation
Custom macro
Handle retrace function
Polygon cutting
Synchronized function
Dual check safety
Network I/O function
Reference position setting
Helical interpolation, RS-232C

Others
Splash guard interlock
Coolant
Pneumatic unit
Machine light
Non-fuse breaker
SP2 Work ejector & inner high pressure coolant
Chuck close confirmation
Total & preset counter (Custom menu)
Cut-off confirmation
High pressure coolant
Revolving tool (HD2)
Spindle brake
Air blow
Parts catcher & Parts conveyor
Chip conveyor
Coolant level switch
Bar feeder interface
Signal tower
Automatic power shut-off
Thermo revision

Optional accessories
Drill breakage detector
Part carrier
Chip box
Tool holder, tools, etc.

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