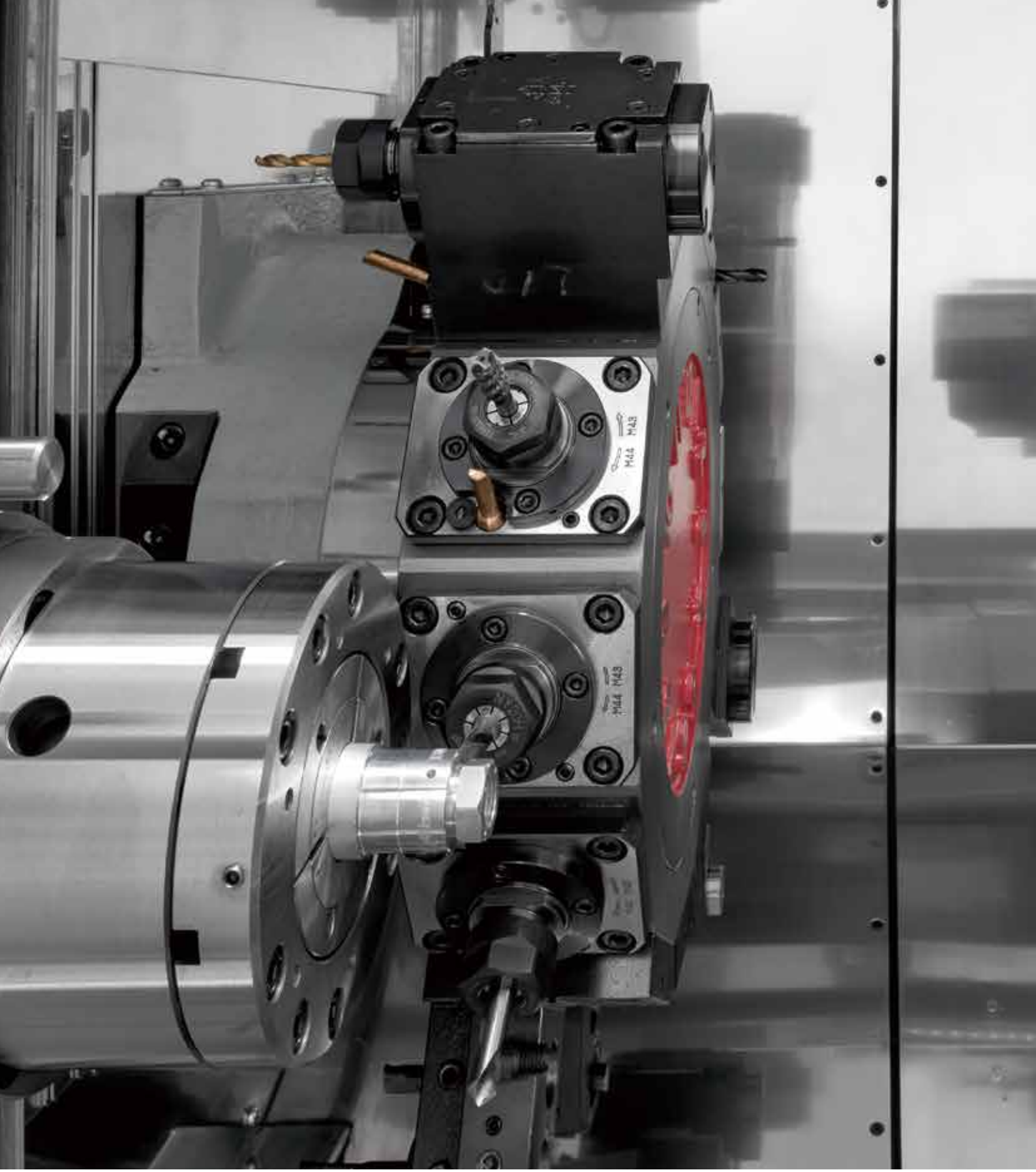
CITIZEN

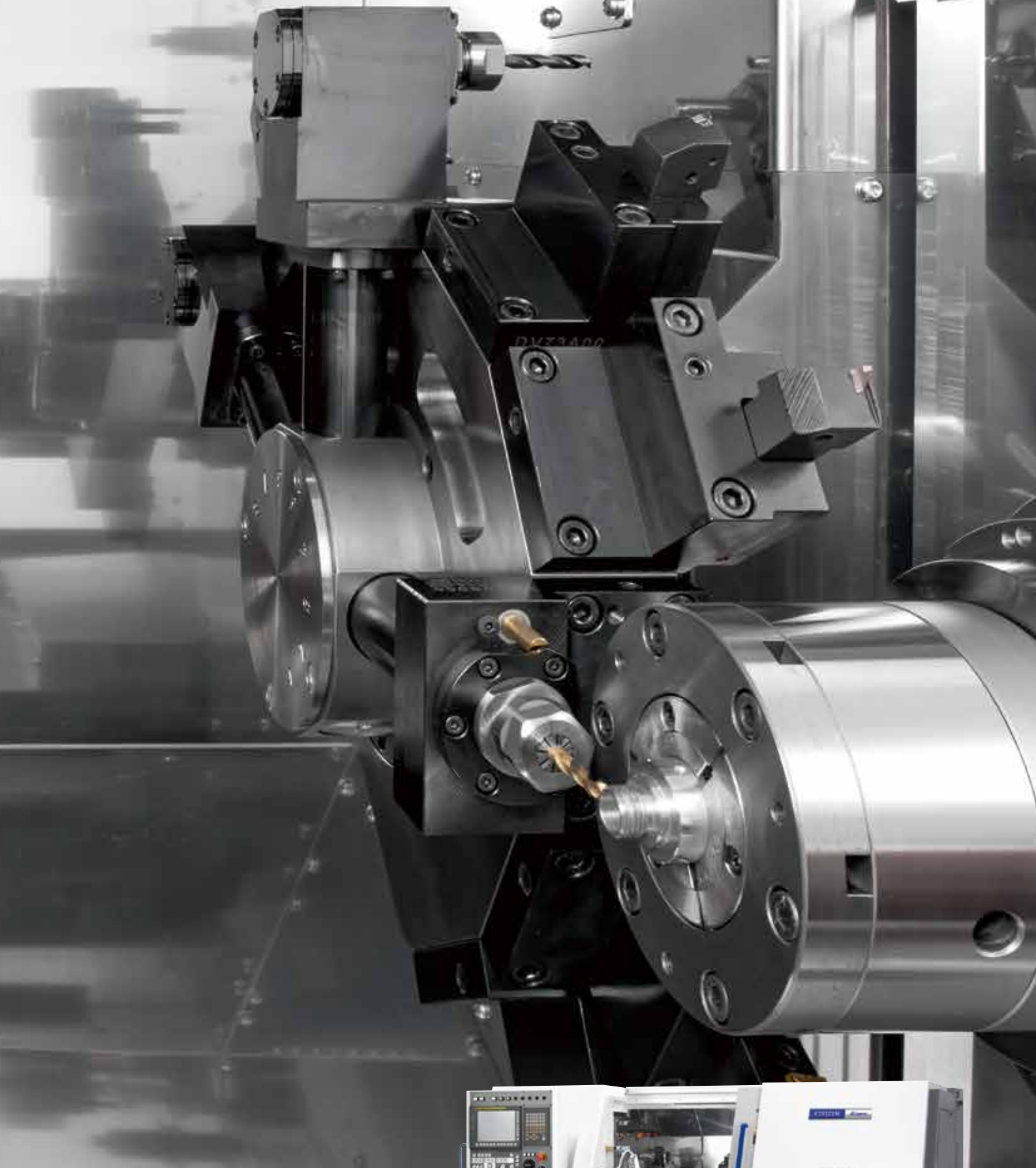
Miyano

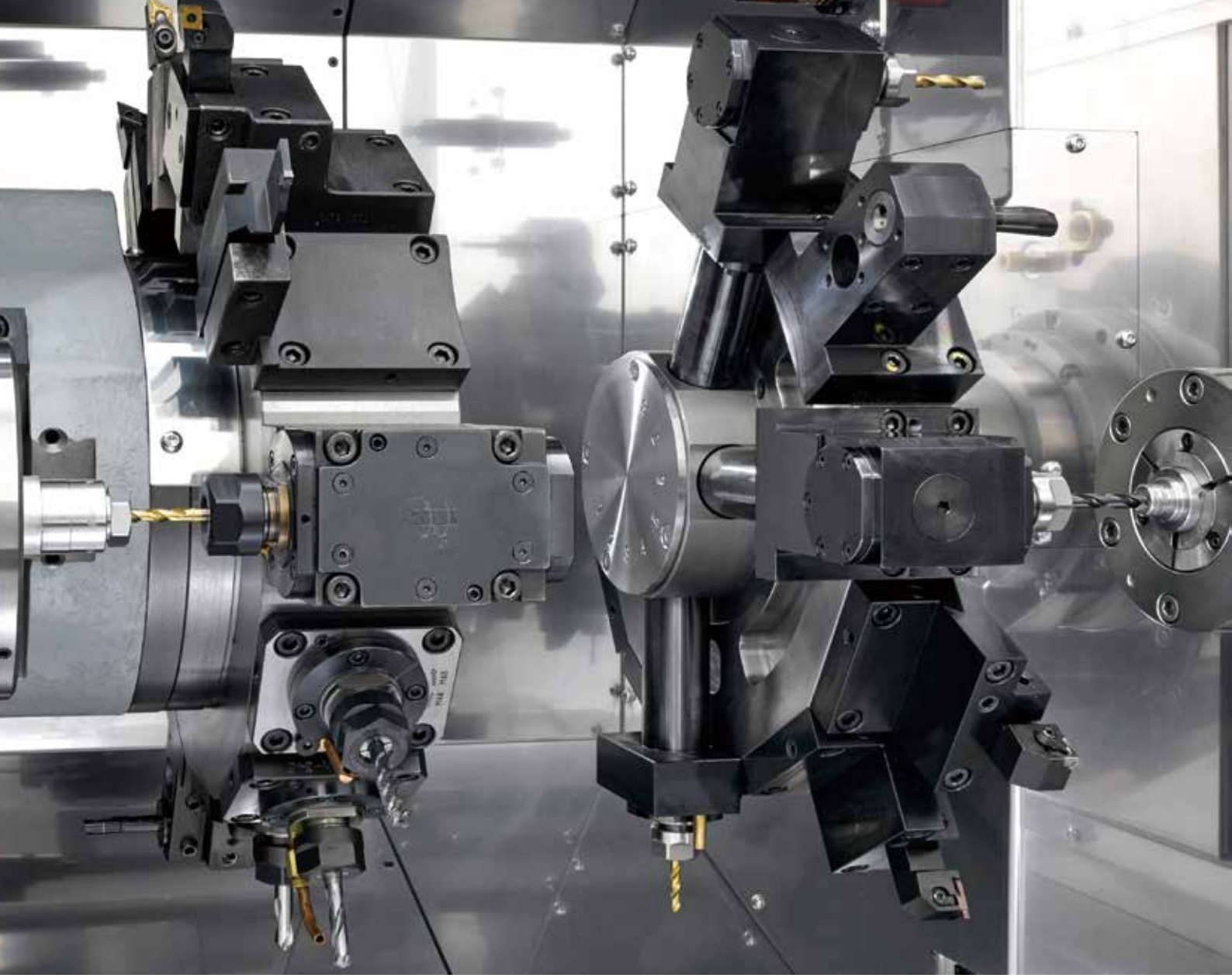
BNJ42/51

Fixed Headstock Type CNC Automatic Lathe



The 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 revolving tools (option) 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

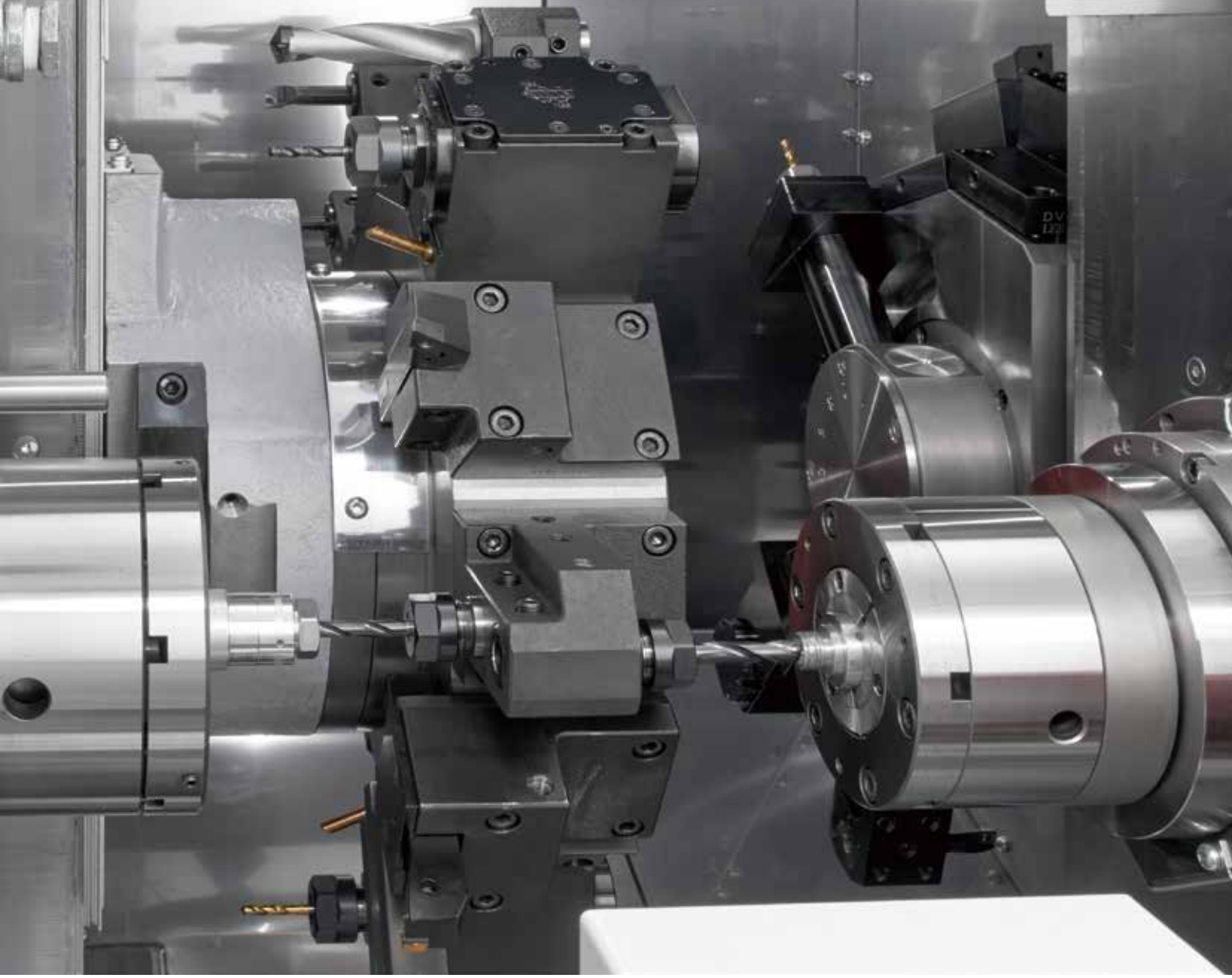
Since a single drive mechanism is used to drive the revolving tools, they can be mounted at all stations. With a maximum torque of 25 Nm, they can handle heavy-duty cutting too.

Turret No. 2 Accommodating Revolving Tools(option) and with a Bigger Tool Capacity

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

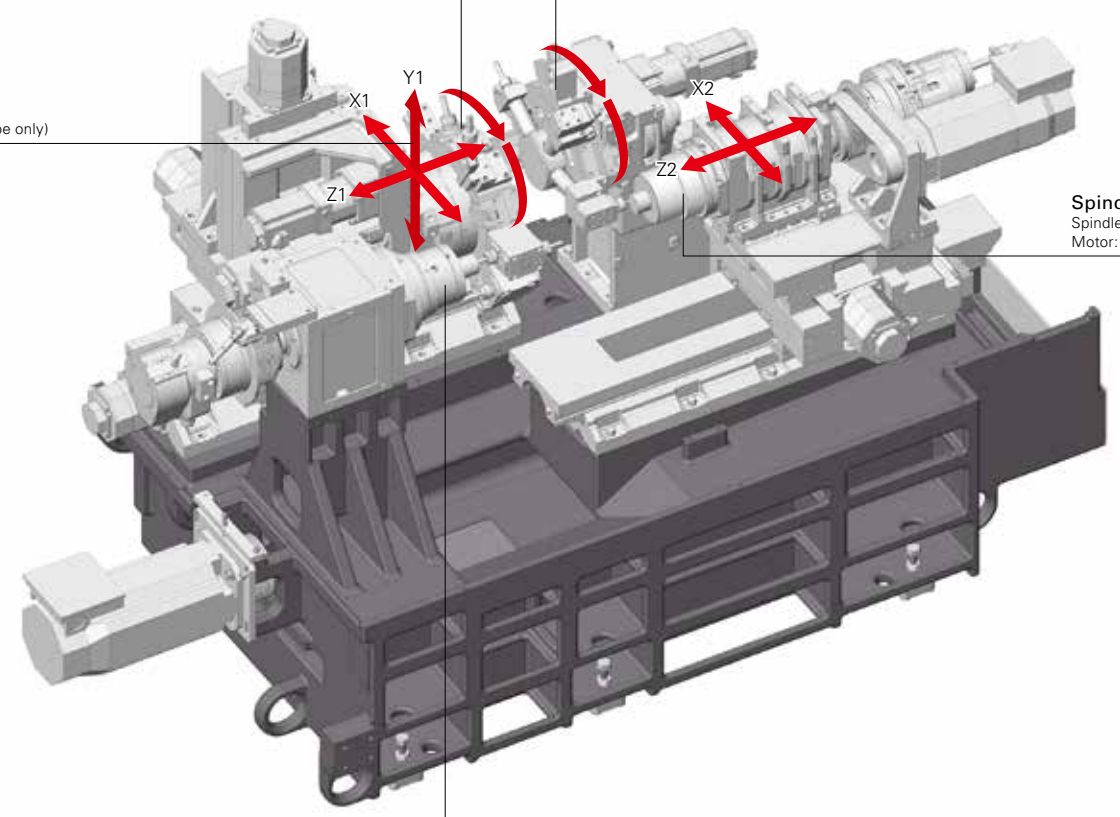
Superimposition control, where the move commands of turret No. 2 that can move in the X and Z directions are overlapped on the movement of turret No. 1, can achieve substantial reductions in machining time.

Basic Construction

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

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

Y axis (SY type only)



Spindle No. 2
Spindle speed: 5000 min^{-1}
Motor: 7.5/5.5 KW

Spindle No. 1
Spindle speed: 6000 min^{-1} (BNJ42) / 5000 min^{-1} (BNJ51)
Motor: 15/11 kW

Considerably Improved Operability

The operation panel that was at the top of the previous machines has been moved to the left side of the machine. 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.

existing machine tooling area

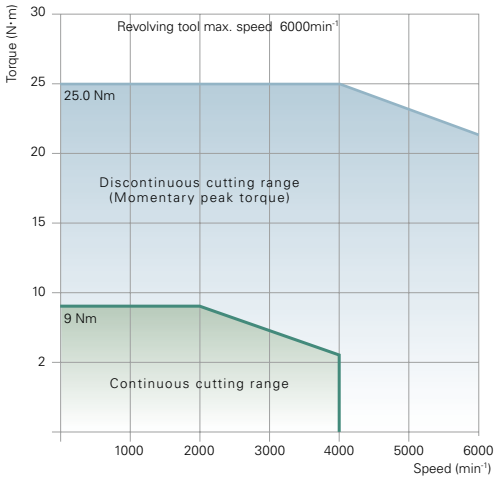
BNJ42/ BNJ51 tooling area

High-rigidity spindle and higher-torque revolving tools

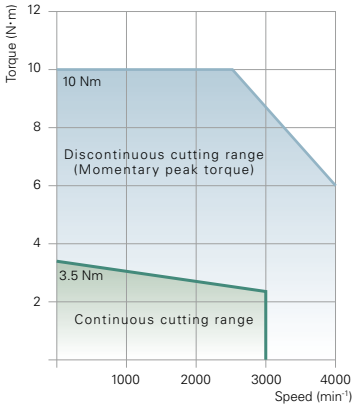
Both the main spindles of the BNJ-42 adopted angular contact ball bearings at the front and double-row cylindrical roller bearings at the rear, while the BNJ-51 further increased the rigidity of spindle 1 by adopting the combination of angular contact ball bearings and double-row cylindrical roller bearings 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, facilitating high-precision machining.
In addition, the use of rigid 25 Nm revolving tools on turret No. 1 realizes stable milling.

Revolving Tool Torque Diagram
Turret No.1

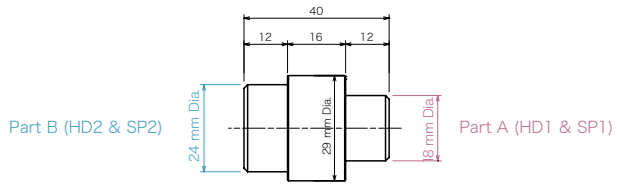


Revolving Tool Torque Diagram
Turret No.2

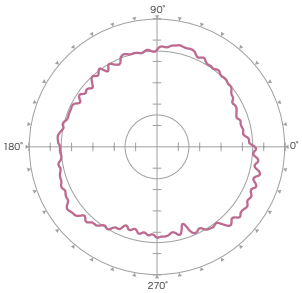


Machining accuracy

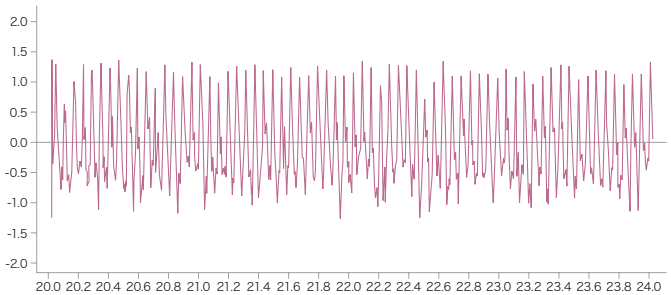
Test piece
Material : BSBM (Brass)
Spindle speed : 3,000 min-1
Feed : 0.06 mm/rev
Depth of cut : 0.5 mm (in diameter), 0.25 mm (in radius)



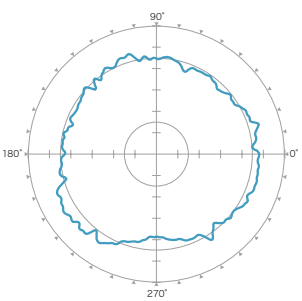
Roundness (part A)
0.66µm



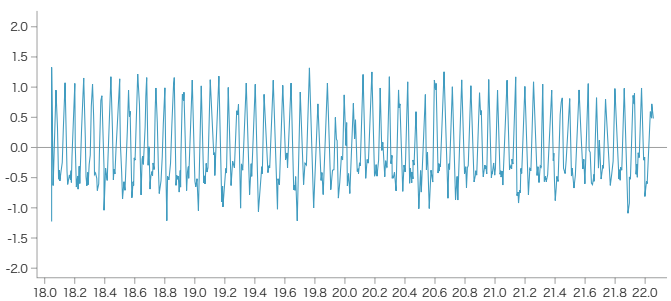
Surface roughness (part A)
Rz 2.5468µm



Roundness (part B)
0.62µm



Surface roughness (part A)
Rz 2.3419µm

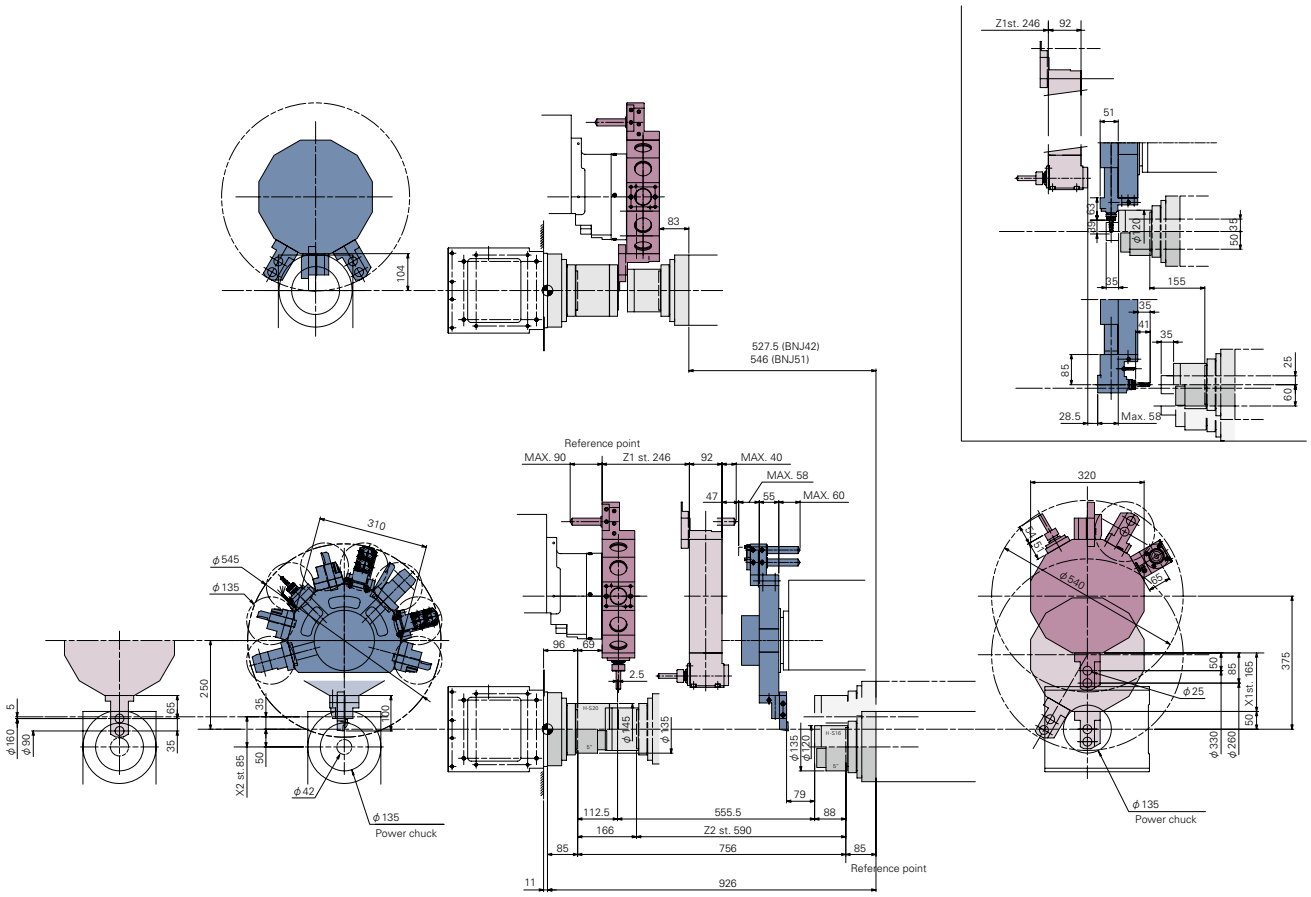


^This data does not guaranty accuracy.

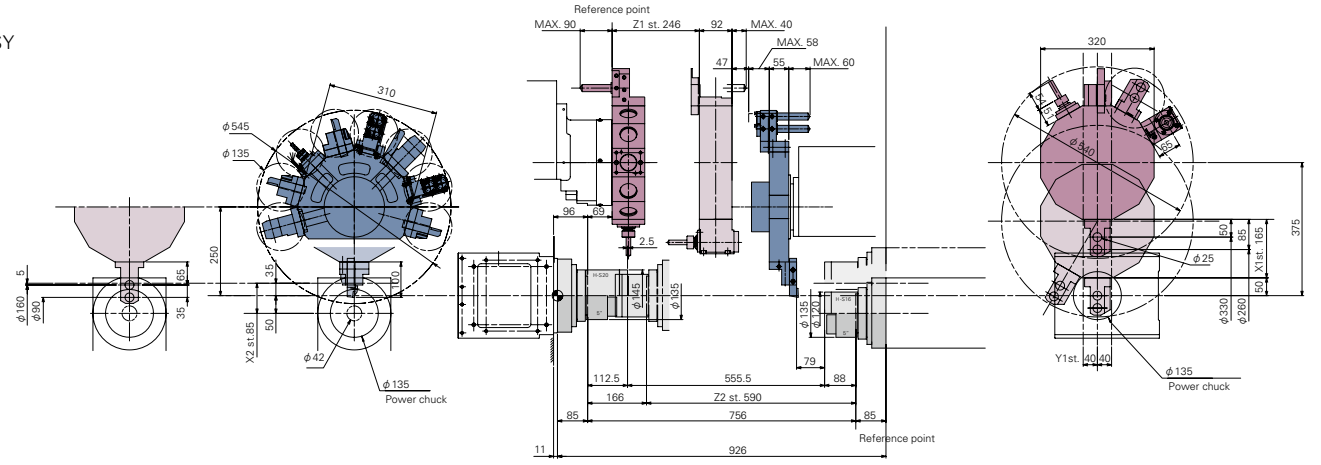
Tooling area

BNJ42S

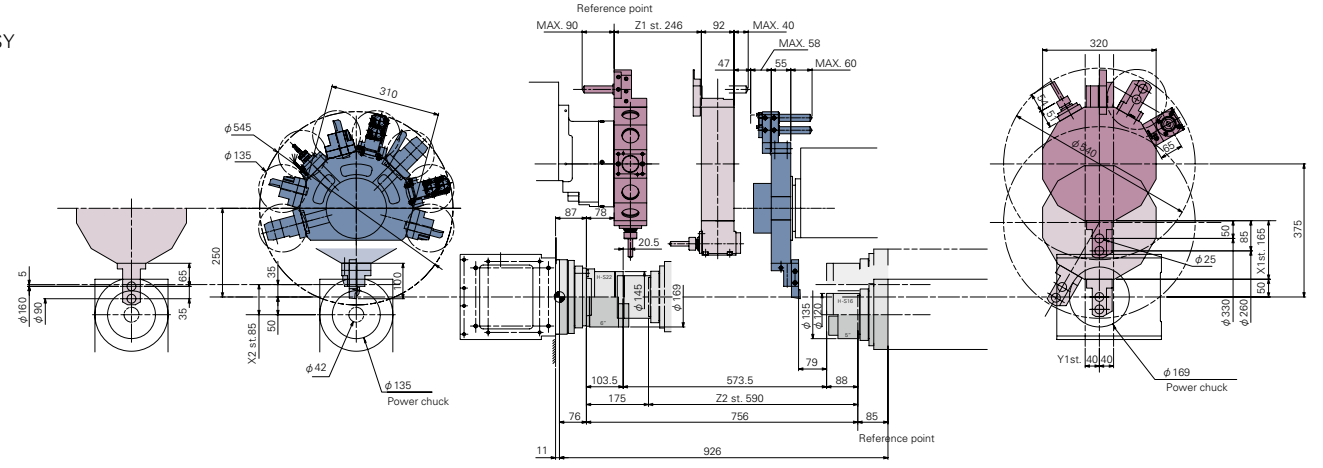
Spindle No.2 with Revolving tool



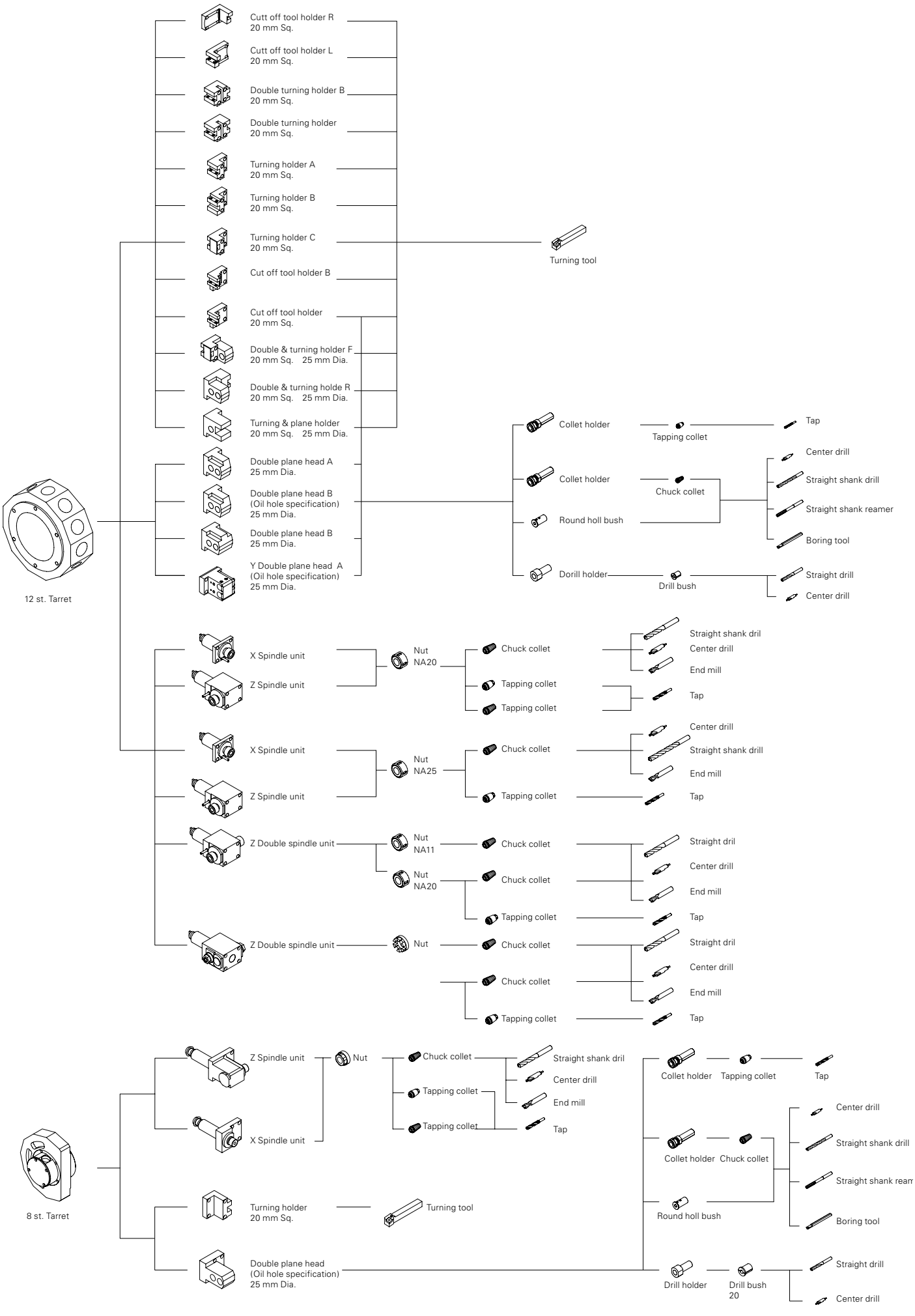
BNJ42SY



BNJ51SY

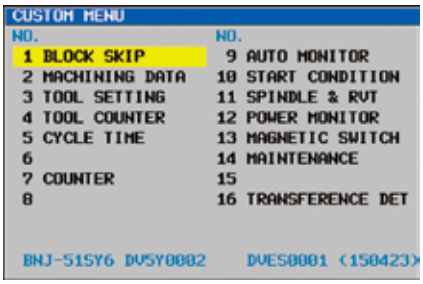


Tooling system



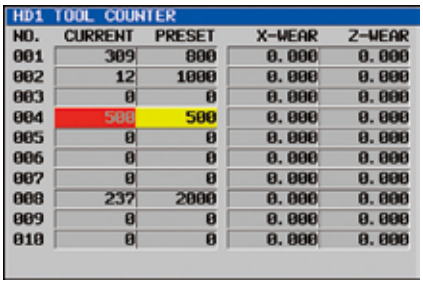
NC Custom Menu

Machining support screens are provided to improve working efficiency.



Menu screen

Displays the list of custom screens

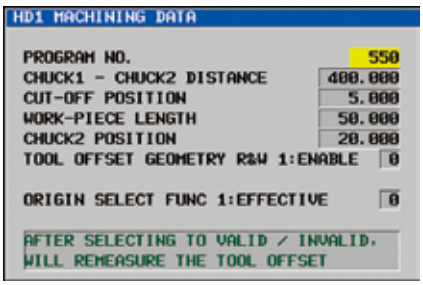


Tool counters

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

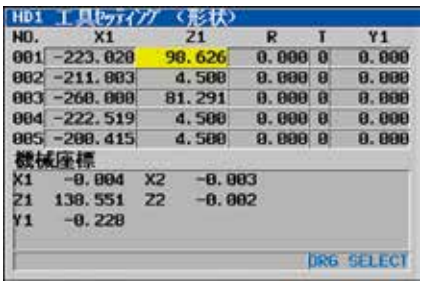
Cycle time display

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



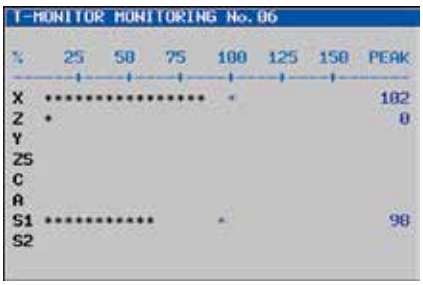
Machining data

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.



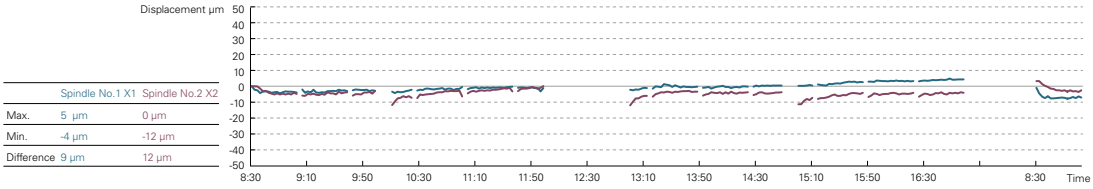
Tool monitor

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.

Thermo Revision

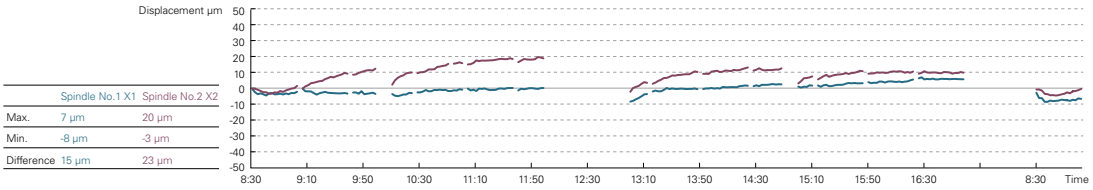
This is a thermal displacement correction system that measures the temperature of each part of the machine with sensors installed inside it, and corrects the thermal displacements on the X-axis and Z-axis by inputting coefficients prepared for oil-based and water soluble coolants.

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



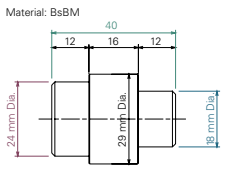
	Spindle No.1 X1	Spindle No.2 X2
Max.	5 µm	0 µm
Min.	-4 µm	-12 µm
Difference	9 µm	12 µm

Continuous cutting of brass No revolving tool operation (Thermorevision 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

^ This function cannot guaranty accuracy.

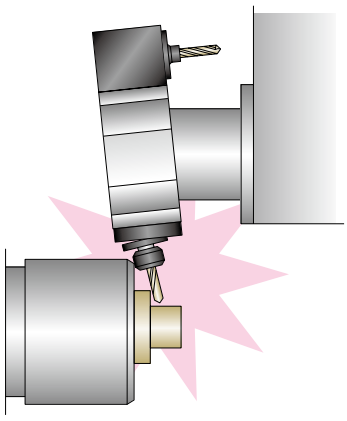


Collision buffering

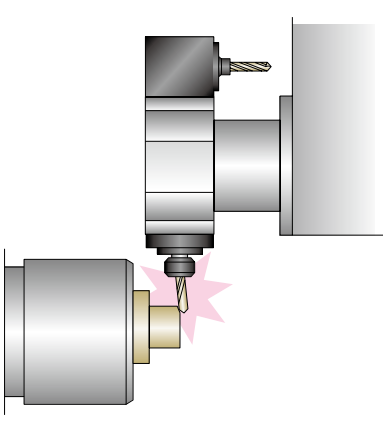
When interference is encountered in rapid traverse operation, the function decelerates and stops axis feed and generates retraction torque to retract the feed axis in the opposite direction to the collision direction, limiting damage to the machine.

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

Without the collision buffering function



With the collision buffering function



Options

Part catcher
These optional devices are indispensable for bar work.

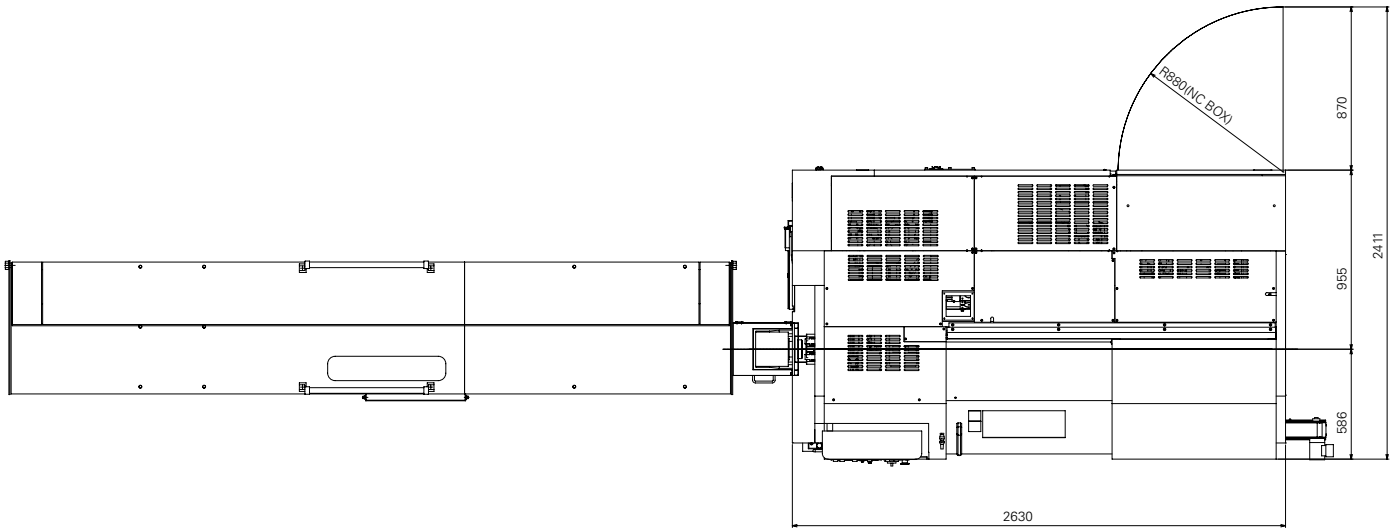
Part conveyor
These optional devices are indispensable for bar work.

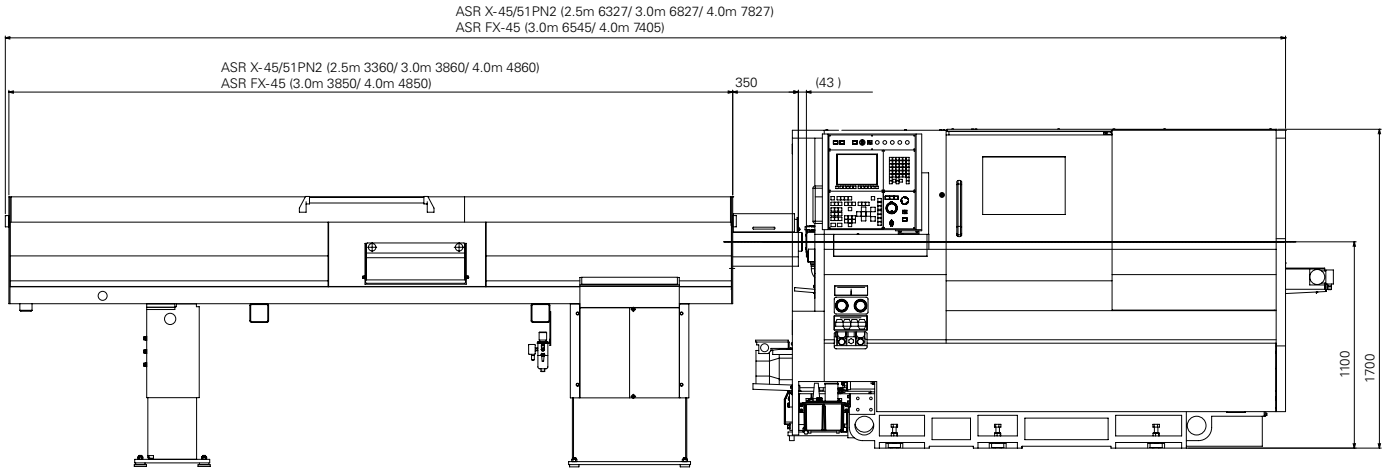
Drill breakage detector
Drill breakage is detected by the swing cylinder. The machine stops when breakage is detected, and a second accident can be prevented.

Bar loader
Indispensable unit for protracted unmanned bar work operation.

Chip conveyor
Ejects chips smoothly. This optional unit is indispensable for protracted unmanned operation.

External view





Machine specifications

		BNJ-42S6	BNJ-42SY6	BNJ-51SY6
Machining capacity				
Maximum machining length		100 mm		
Diameter of standard cutting	Spindle No. 1	42 mm Dia.		51 mm Dia.
	Spindle No. 2	42 mm Dia.		
Chuck size	Spindle No. 1	5 inch		6 inch
	Spindle No. 2	5 inch		
Spindle				
Number of spindle		2		
Spindle speed range	Spindle No. 1	6,000 min^{-1}		5,000 min^{-1}
	Spindle No. 2	5,000 min^{-1}		
Inner diameter of draw tube	Spindle No. 1	52 mm Dia.		
	Spindle No. 2	43 mm Dia.		
Collet chuck	Spindle No. 1	H-S22, DIN177E		
	Spindle No. 2	JPN, H-S16, DIN171E		
Power chuck	Spindle No. 1	5" thru-hole chuck		6" thru-hole chuck
	Spindle No. 2	5" thru-hole chuck		
Turret				
Number of turret		2		
Type of turret	Turret No. 1	12 station turret		
	Turret No. 2	8 station turret		
Shank height of square turning tool		20 mm Sq.		
Diameter of drill shank		25 mm 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 min^{-1}		
	Turret No. 2	3,000 min^{-1}		
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)		
Slide stroke				
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		
Feed rate				
Rapid feed rate	X1 axis	20 m/ min		
	Z1 axis	20 m/ min		
	Y1 axis	---	12 m/ min	
	X2 axis	20 m/ min		
	Z2 axis	20 m/ min		
Motors				
Spindle drive	Spindle No. 1 Cs	15/ 11 kw (15 min/ cont.)		
	Spindle No. 2 Cs	7.5/ 5.5 (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		
Tank capacity				
Hydraulic oil tank capacity		10 L		
Lubricating oil tank capacity		4 L		
Coolant tank capacity		300 L		
Machine dimensions				
Machine height		1,700 mm		
Floor space		2,840×1,560 mm (without Chip conveyor)		
Machine weight		5,300 kg		
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)				
Optional accessories				
Cut-off confirmation, High pressure coolant, Revolving tool (HD2), Spindle brake, Drill breakage detector,				
Air blow, Part carrier, Parts catcher & Parts conveyor, Chip conveyor, Chip box, Coolant level switch,				
Bar feeder interface, Coolant mist collector & blast-proof damper, Signal tower, Automatic power shut-off,				
Automatic fire extinguishing equipment, Thermo revision, Tool holder, tools, etc.				

NC specifications	
Device	FS 0i-TF
Controlled axis	Simultaneously controlled axis Max.4
	X_1, Z_1, Y_1, Cs_1, A_1, A^2(Opt.) X_2, Z_2, Cs_2,
Min. input increment	0.001 mm, 0.0001 inch, 0.001 deg
Min. output increment	X axis: 0.0005 mm, X axis: Z0.001 mm
	Y axis: 0.001mm
Parts program strage capacity	Total 1MB (2,560mTape length)
Spindle function	Spindle speed S4-digits
	Constant Cutting speed control (G96)
Rapid traverse rate	X1, X2, Z1 axis: 20m/ min
	Z2 axis: 20m/ min
	Y1 axis: 12m/ 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 wearcompensation 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	
Reference position setting.	
NC option	
Helical interpolation, RS-232C.	

Environmental Information

Basic Information	model		
	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	0.0798kWh/cycle*3
		Power consumption value above converted to a CO2 value*4	378g/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.

CITIZEN MACHINERY CO., LTD.

CITIZEN

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