CITIZEN

Miyano

BNJ42/51

Fixed Headstock Type CNC Automatic Lathe

Multipurpose midsize high precision CNC turning center 51mm bar capacity, 2 spindles and 1 turret with Y-Axis.

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.


CITIZEN
BNJ51

Basic construction.

BNJ42/51

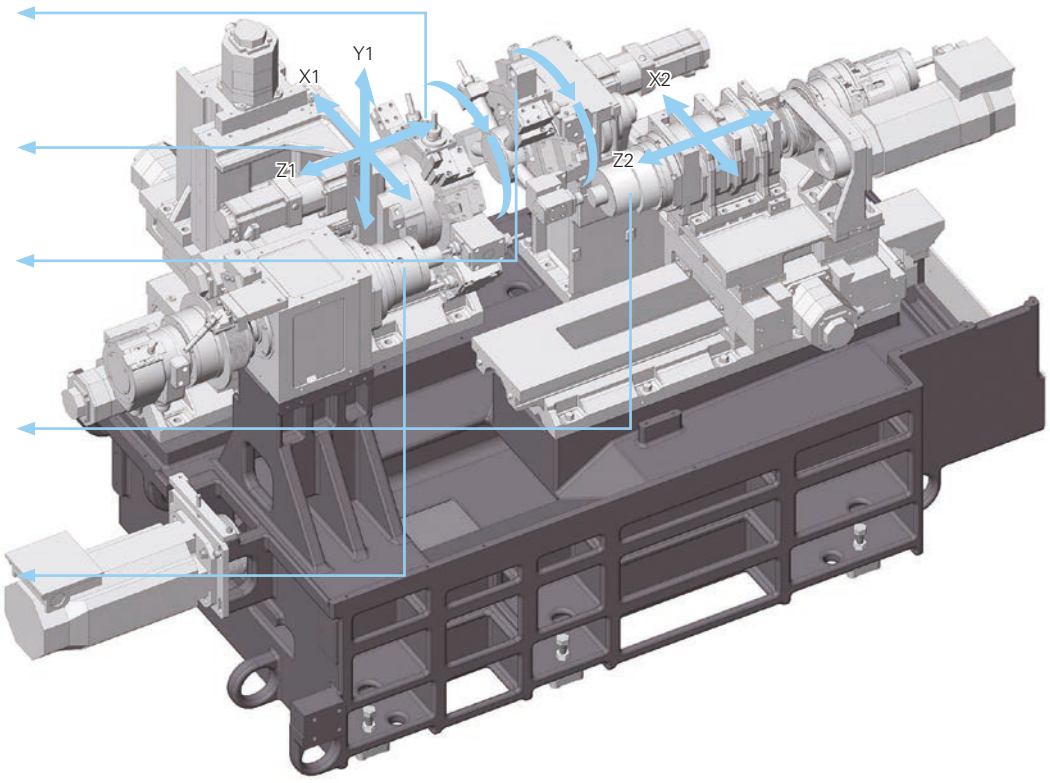
Turret No. 1
Type of the turret No.: 12 St.
Number of revolving tools mountable: 12 (25 Nm)

Y axis (SY type only)

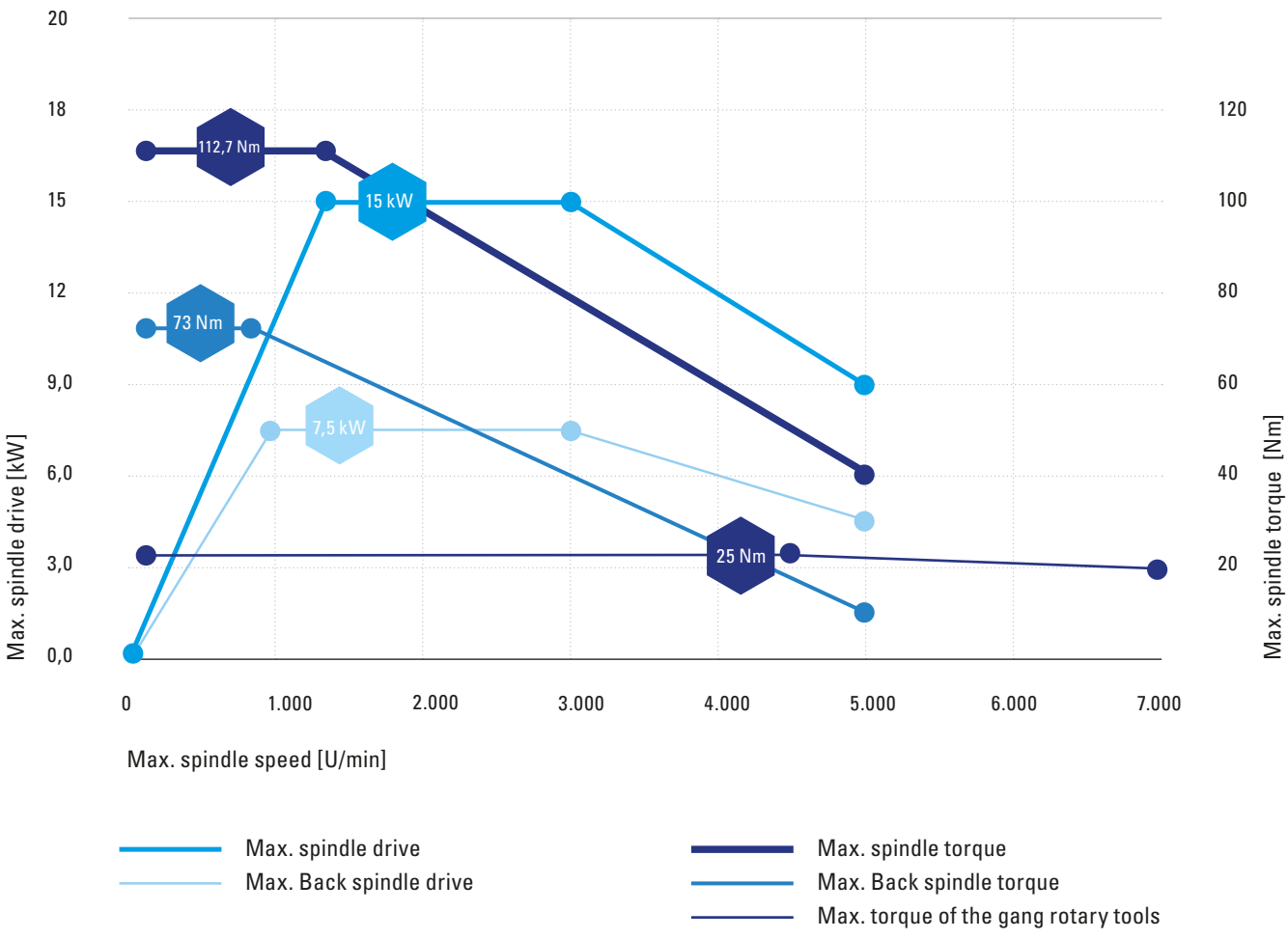
Turret No. 2
Type of the turret : 8 St.
Number of revolving tools mountable: 4 (10 Nm)

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

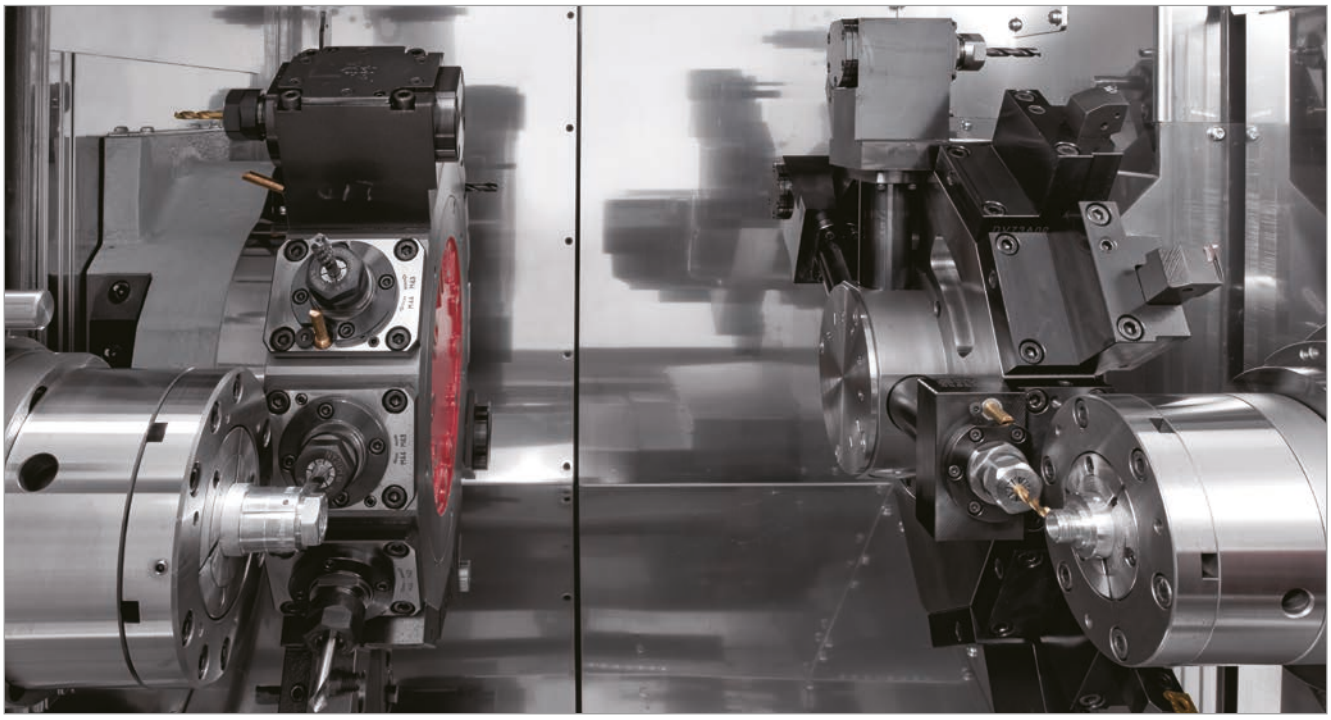
Spindle No. 1
Spindle speed:
6000 min^{-1} (BNJ42) /
5000 min^{-1} (BNJ51)
Motor: 15/11 kW



Power and torque graph of the Miyano BNJ42/51



Compact design of a various tooling system with the highest rigidity to achieve the maximum accuracy and flexibility.



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 ef ficiency 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.

Considerably Improved Operability

existing machine tooling area

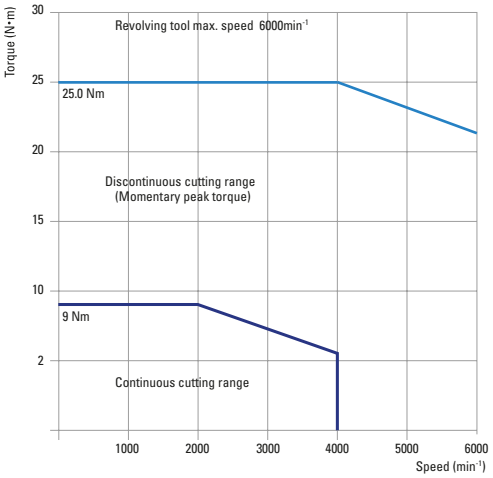
BNJ42/ BNJ51 tooling area

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.

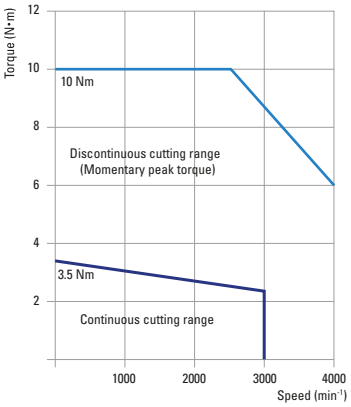
High-rigidity spindle and higher-torque revolving tools.

Revolving Tool Torque Diagram

Turret No.1



Turret No.2



Both spindles of the BNJ-series 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 doublerow cylindrical roller bearings at the front and double-row cylindrical roller bearings at the rear.

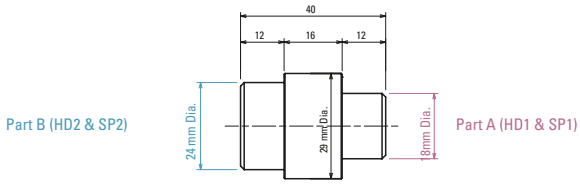
Assembling and inspecting these spindles based on a strict management system gives them ample rigidity and suppression of abnormal heat output, and manageable thermal displacement characteristics, facilitating high-precision machining. In addition, the use of rigid 25 Nm revolving tools on turret No. 1 realizes stable milling.

Machining accuracy.

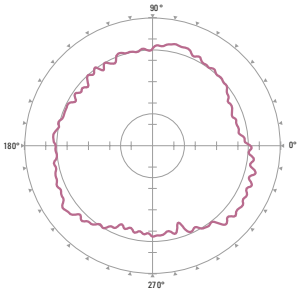
Accuracy

Test piece

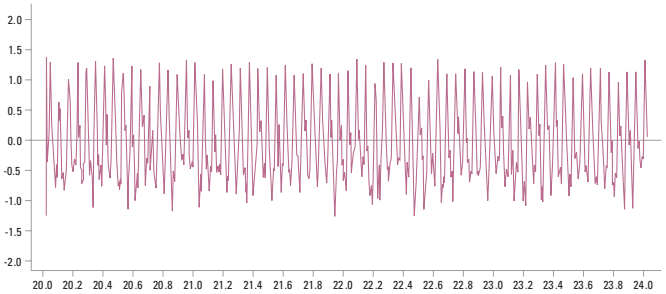
Material:	BSBM (Brass)
Spindle speed:	3.000 min-1
Feed:	0.06 mm/rev
Depth of cut:	0.5 mm (in diameter), 0.25 mm (in radius)



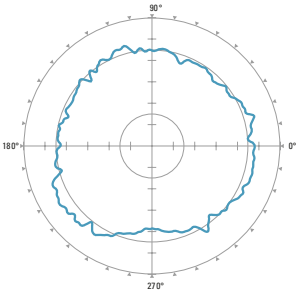
Roundness (part A)
0.66µm



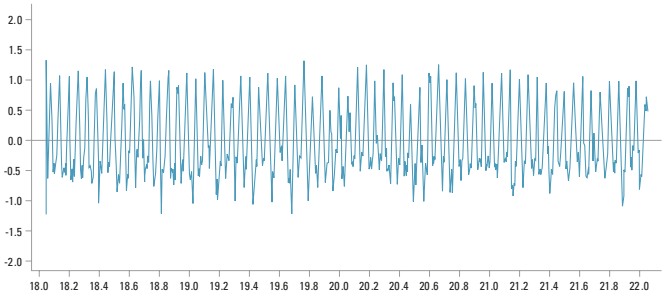
Surface roughness (part A)
Rz 2.5468µm



Roundness (part B)
0.66µm



Surface roughness (part A)
Rz 2.3419µm

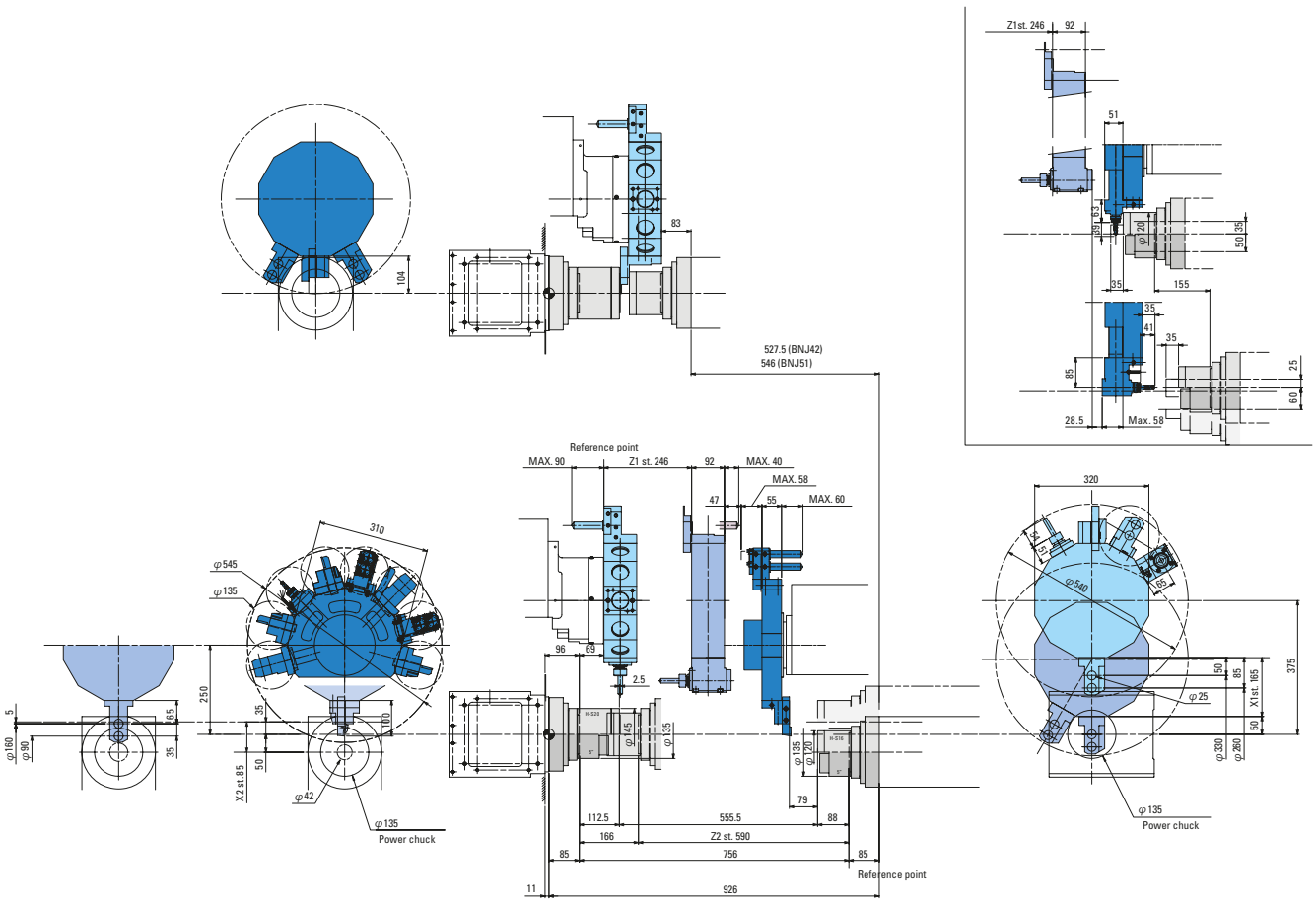


* This data does not guaranty accuracy.

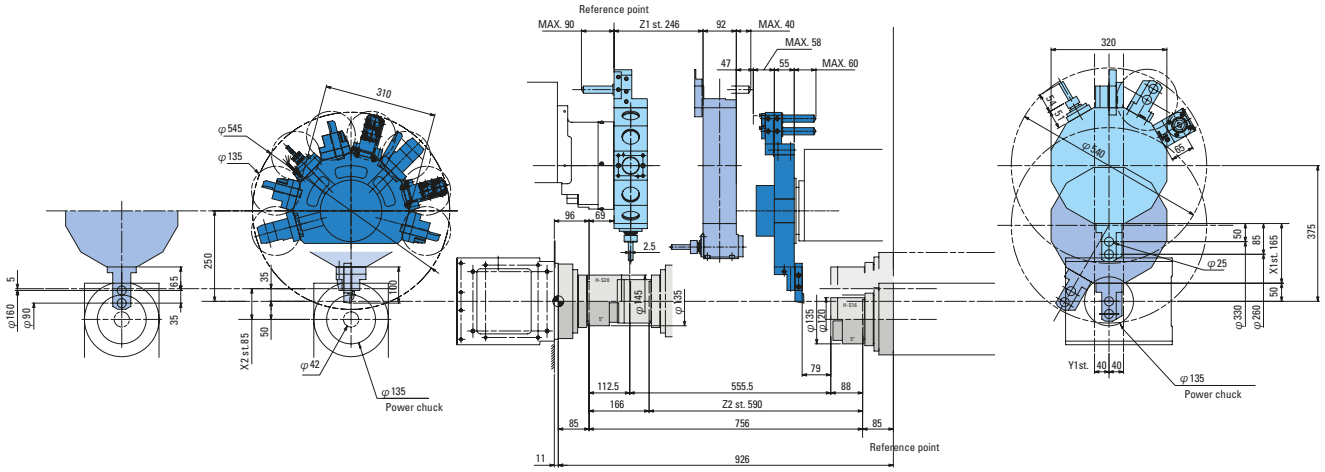
Tooling area.

BNJ42S

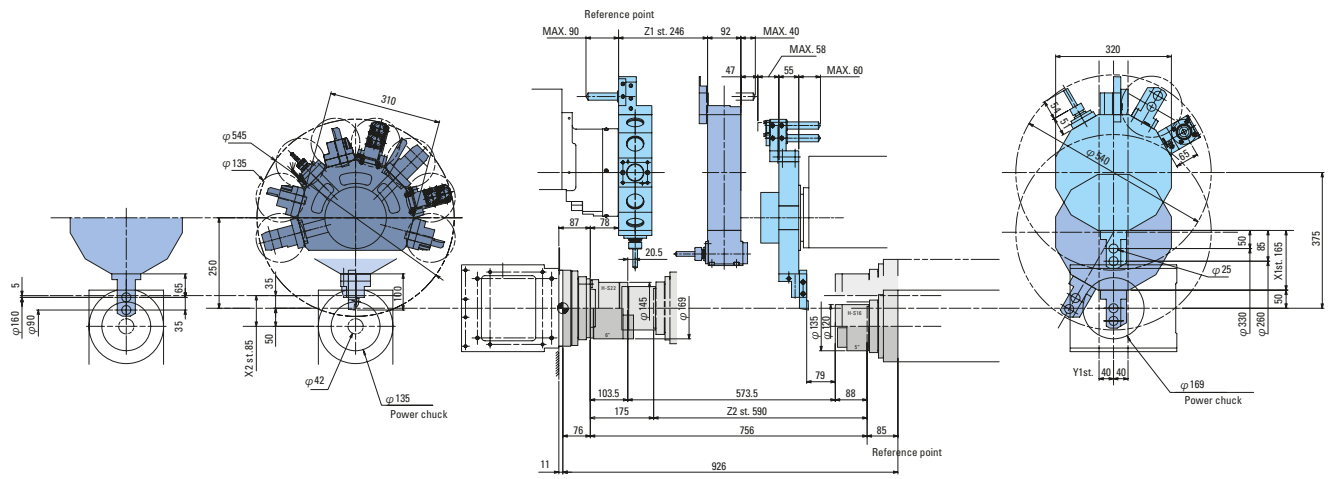
Spindle No.2 with Revolving tool



BNJ42SY

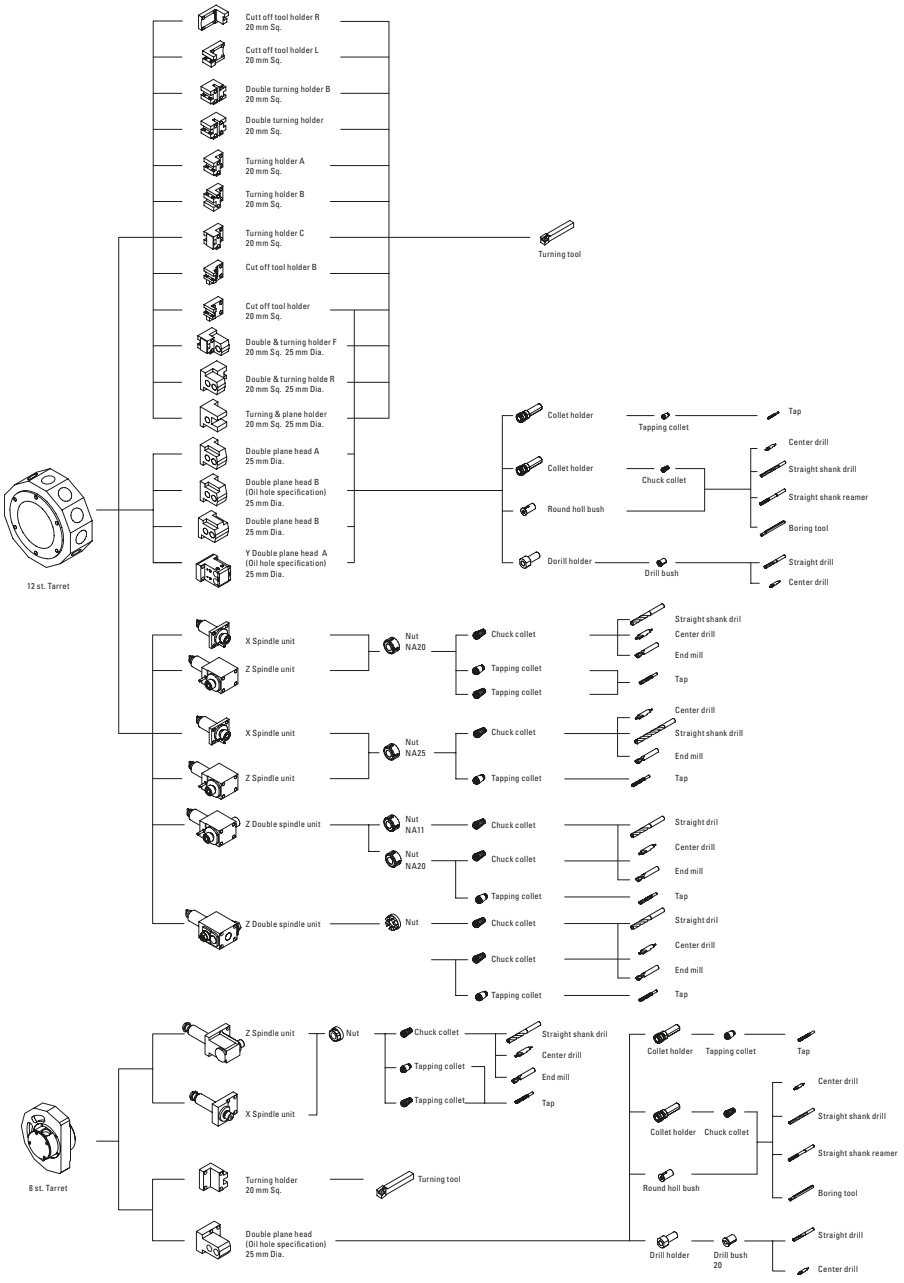


BNJ51SY



Tooling system.

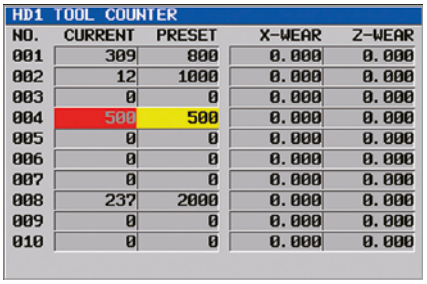
Toolholder



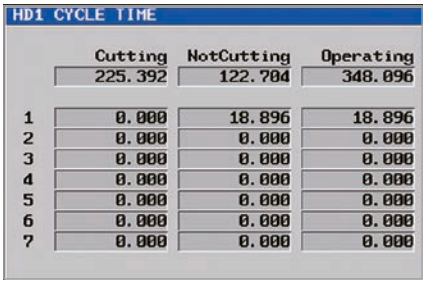
NC Custom Menu.

Machining support screens are provided to improve working efficiency

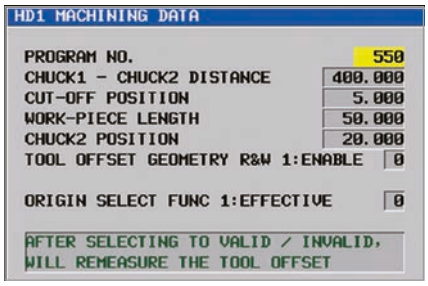
Menu screen
Displays the list of custom screens



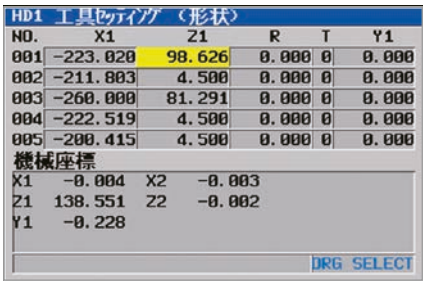
Tool counters
Used to set and reset the tool counter stop value and enter the tool wear offsets.



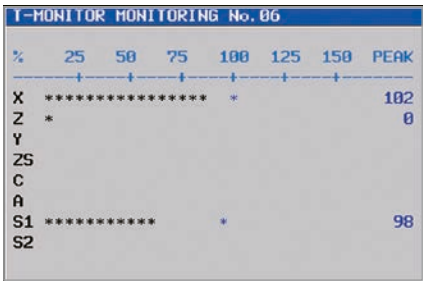
Cycle time display
Measures the cutting time, non-cutting time and running time in each cycle.



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.

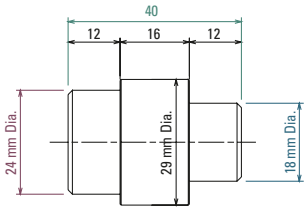


Tool monitor
Allows you to monitor tool wear and breakage by checking the current state of the machining and status of the cutting tools in terms of numerical values based on the sampling data.

Thermo Revision.

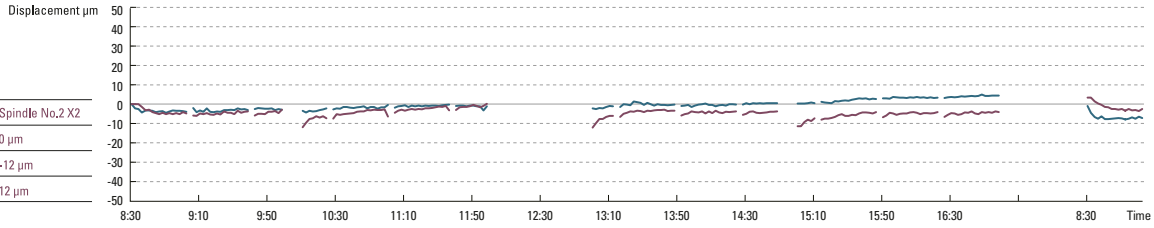
This is a thermal displacement correction system that measures the temperature of each part of the machine with sensors installed inside it, and corrects the thermal displacements on the X-axis and Z-axis by inputting coefficients prepared for oil-based and water soluble coolants.

Material: BsBM



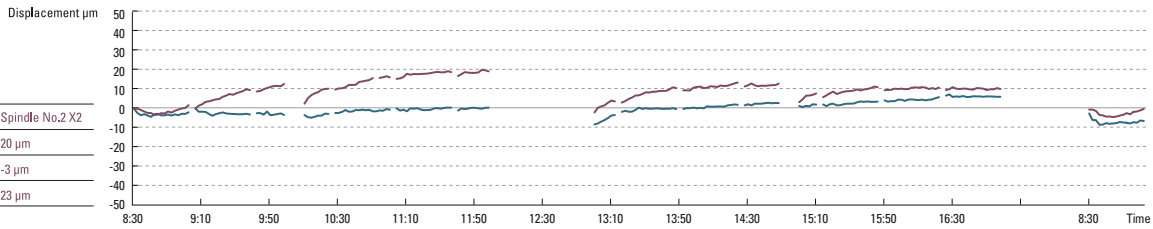
Continuous cutting of brass **No revolving tool operation (Thermorevision compensation ON)**

	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) Duty 13%**

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

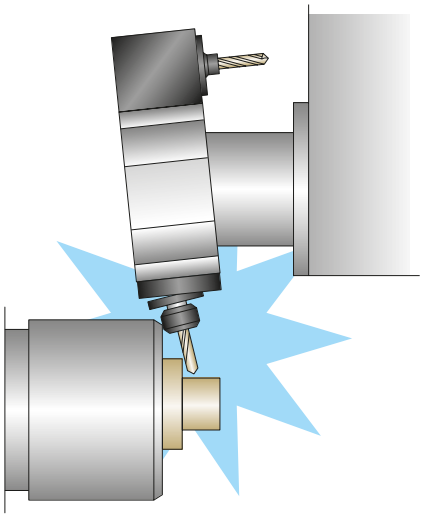


*This function cannot guaranty accuracy.

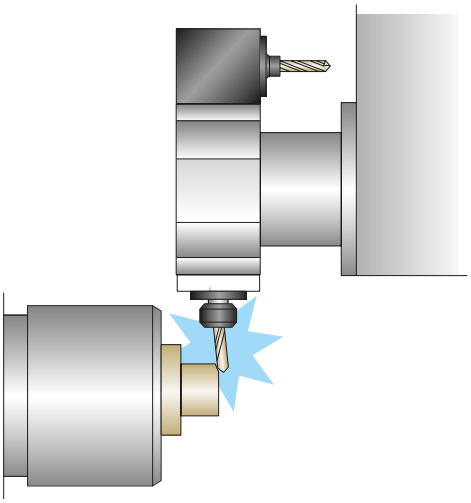
Collision buffering.

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.

Without the collision buffering function



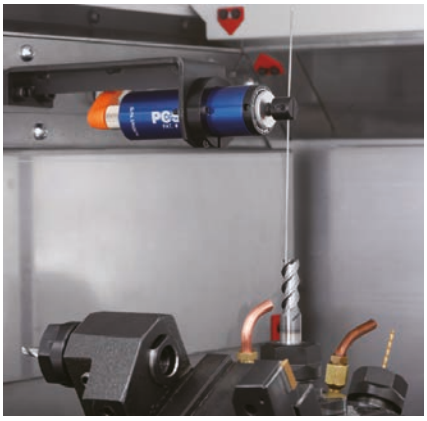
With the collision buffering function



Options.

Part catcher
These optional devices are indispensable for bar work.

Part conveyor
These optional devices are indispensable for bar work.

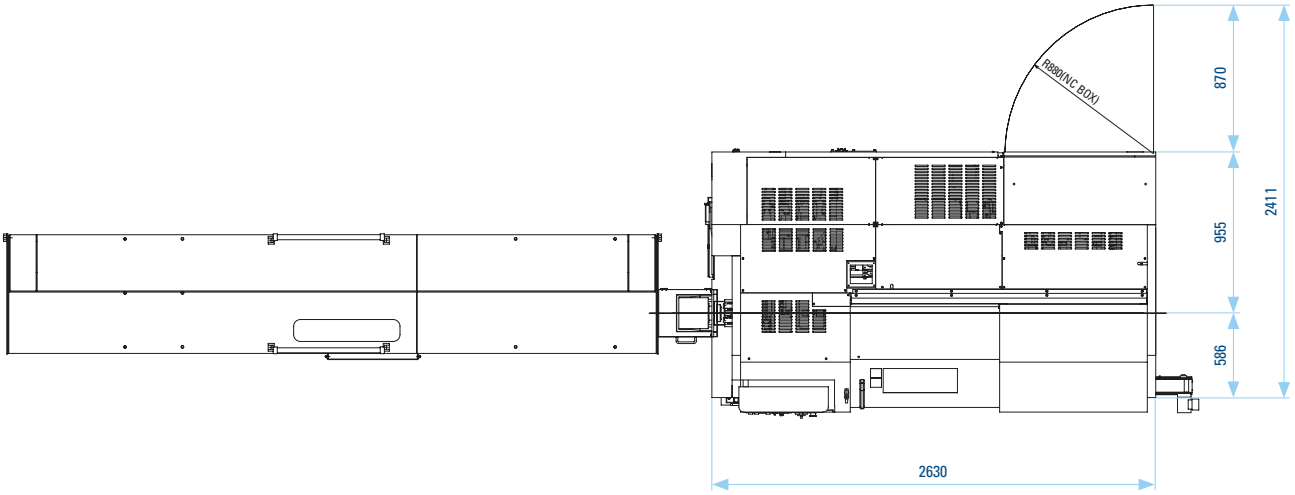


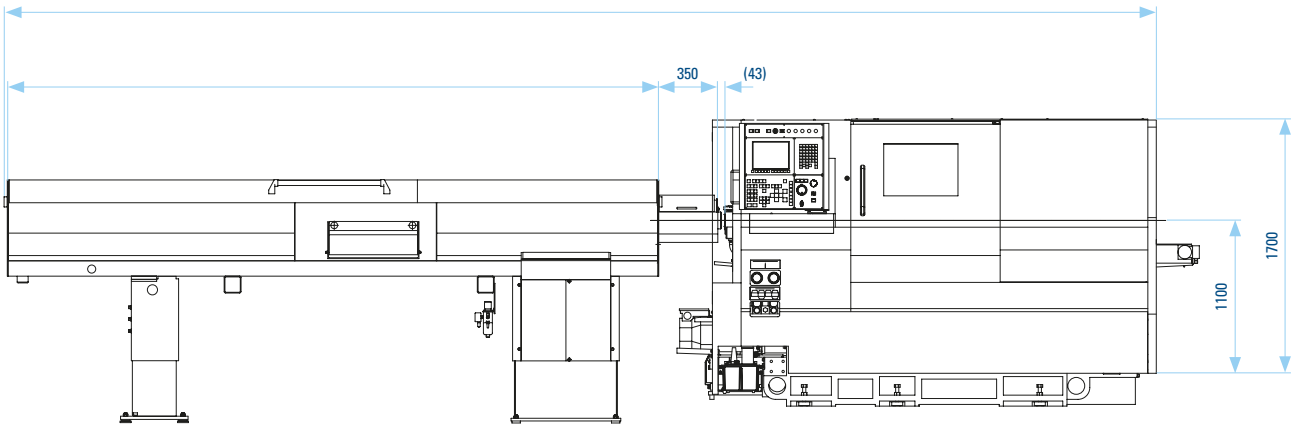
Drill breakage detector
Drill breakage is detected by the swing cylinder. The machine stops when breakage is detected, and a second accident can be prevented.

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.





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Machine specifications

Items			BNJ-42S6	BNJ-42SY6	BNJ-51SY6
Machining capacity					
Maximum machining length					100 m
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)					

NC Specification	
Device	FS 0i-TF
Controlled axis	Simultaneously controlled axis Max.4 X1, Z1, Y1, Cs1, A1, A2(Opt.) X2, Z2, Cs2,
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 (2.560 mTape 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	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	Energy usage	Power supply voltage	AC 200 V
		Electrical power requirement	14.5 kVA
		Required pneumatic pressure	0.5 MPa
Environmental Performance Information	Power consumption	Standby power[1]	0.524 kW
		Power consumption with model workpiece[2]	0.017 kWh/cycle
		Power consumption value above converted to a CO^2 value[3]	8.1 g/cycle
	Air consumption	Required air flow rate	90 Nl/min(max. 240 NL/ min., during air blow)
	Lubricant consumption	At power ON	5.5 cc/30 min
	Noise level	Value measured based on JIS	80 dB
Approach to Environmental Issues	Environmental load reduction	RoHS Directive / REACH regulations	Compliant
	Recycling	Indication of the material names of plastic parts	Covered in the instruction manual[4]
	Environmental management	We pursue "Green Procurement," where by 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] This is the value converted in accordance with the CHUBU Electric Power CO^2 emissions coefficient for 2009 as published by the Ministry of the Environment.
[4] 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 Europe GmbH

Mettinger Straße 11 | D-73728 Esslingen
Tel. +49 [0]711 / 3906-100 | Fax: +49 [0]711 / 3906-106
cme@citizen.de | www.citizen.de

Cincom | Tel. +49 [0]711 / 3906-140 | service@citizen.de
Miyano | Tel. +49 [0]741 / 17407-13 | service@citizen.de

Japan | Citizen Machinery Co., LTD. | Cincom Company: 4107-6 Miyota, Miyota-machi, Kita-saku-gun, Nagano-ken, 389-0206, Japan, Tel. 81-267-32-5961, Fax 81-267-32-5928 | Miyano Company: 500 Akazawa, Yabuki-machi, Nishishirakawa-gun, Fukushima-ken, 969-0206, Japan, Tel. 81-248-44-3050, Fax 81-248-44-3051 | **South Asia** | Citizen Machinery Asia Co., Ltd. | 69 Moo 1 Phaholyothin Road, Sanubtube, Wang Noi, Ayutthaya 13170, Thailand, Tel. 66-35-721-833, Fax 66-35-721-835 | **Europe – UK** | Citizen Machinery UK Ltd. | 1 Park Avenue, Bushey, WD23 2DA, UK, Tel. 44-1923-691500, Fax 44-1923-691599 | **USA** | Marubeni Citizen-Cincom Inc. | Boroline Road Allendale, NJ 07401, U.S.A., Tel. 1-201-818-0100, Fax 1-201-818-1877

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