MACHINE SPECIFICATIONS

Items	Model Name	BNJ-34S2	BNJ-42S2	BNJ-34SY2	BNJ-42SY2	BNJ-51SY2
Machining Capacity & Chucking System						
Max. Bar Capacity	L/R-spindle	Φ 34mm (1.34" Dia.)	Φ 42mm (1.65" Dia.)	Φ 34mm (1.34" Dia.)	Φ 42mm (1.65" Dia.)	Φ 51mm (2" Dia.)
	R-spindle	Φ 34mm (1.34" Dia.)	Φ 42mm (1.65" Dia.)	Φ 34mm (1.34" Dia.)	Φ 42mm (1.65" Dia.)	Φ 42mm (1.65" Dia.)
Type of Collet Chuck	L&R-spindle	Stationary	Stationary	Stationary	Stationary	Stationary
Standard Turning Length		100mm	100mm	100mm	100mm	100mm
Size of Power Chuck	L/R-spindle	5" / 5"	5" / 5"	5" / 5"	5" / 5"	6" / 5"
Spindle						
Spindle Nose	L/R-spindle	Sp. Flat/Sp. Flat	Sp. Flat/Sp. Flat	Sp. Flat/Sp. Flat	Sp. Flat/Sp. Flat	A2-6/Sp. Flat
Spindle Speed Range	L-spindle	$80 \sim 7,000 \text{min}^{-1}$	$60 \sim 6,000 \text{min}^{-1}$	$80 \sim 7,000 \text{min}^{-1}$	$60 \sim 6,000 \text{min}^{-1}$	$50 \sim 5,000 \text{min}^{-1}$
	R-spindle	$67 \sim 5,000 \text{min}^{-1}$	$67 \sim 5,000 \text{min}^{-1}$	$67 \sim 5,000 \text{min}^{-1}$	$67 \sim 5,000 \text{min}^{-1}$	$67 \sim 5,000 \text{min}^{-1}$
Spindle Motor (30min./Cont.)	L-spindle	7.5/5.5 kW	11/7.5 kW	7.5/5.5 kW	11/7.5 kW	11/7.5 kW
	R-spindle	5.5/3.7 kW	5.5/3.7 kW	5.5/3.7 kW	5.5/3.7 kW	5.5/3.7 kW
R-SP Slide Stroke	X2	70 mm	70 mm	70 mm	70 mm	70 mm
	Z2	525 mm	525 mm	525 mm	525 mm	525 mm
Main Turret						
Type of Turret Station		12 Station	12 Station	12 Station	12 Station	12 Station
Turret Indexing Time		0.25sec./1st.	0.25sec./1st.	0.25sec./1st.	0.25sec./1st.	0.25sec./1st.
Turret Indexing Methods		AC Servo & Curvic C.	AC Servo & Curvic C.	AC Servo & Curvic C.	AC Servo & Curvic C.	AC Servo & Curvic C.
Slide Stroke	X1	165 mm	165 mm	165 mm	165 mm	165 mm
	Z1	246 mm	246 mm	246 mm	246 mm	246 mm
	Y1	± 40 mm	± 40 mm	± 40 mm	± 40 mm	± 40 mm
Back-working Turret						
Type of Turret Station		6 Station	6 Station	6 Station	6 Station	6 Station
Turret Indexing Time		0.2sec./1st.	0.2sec./1st.	0.2sec./1st.	0.2sec./1st.	0.2sec./1st.
Turret Indexing Methods		AC Servo & Curvic C.	AC Servo & Curvic C.	AC Servo & Curvic C.	AC Servo & Curvic C.	AC Servo & Curvic C.
Revolving Tools (Main Turret / Option)						
No. of Revolving Tools Station		12	12	12	12	12
Tool Speed Range		$60 \sim 6,000 \text{min}^{-1}$	$60 \sim 6,000 \text{min}^{-1}$	$60 \sim 6,000 \text{min}^{-1}$	$60 \sim 6,000 \text{min}^{-1}$	$60 \sim 6,000 \text{min}^{-1}$
Tool Motor		2.5 kW	2.5 kW	2.5 kW	2.5 kW	2.5 kW
Machining Capacity	Drill/Tap	Φ 13mm/M8xP1.25	Φ 13mm/M8xP1.25	Φ 13mm/M8xP1.25	Φ 13mm/M8xP1.25	Φ 13mm/M8xP1.25
Machine Dimensions						
Machine Height		1,720mm (67.7")	1,720mm (67.7")	1,720mm (67.7")	1,720mm (67.7")	1,720mm (67.7")
Floor Space		2,790mm x 1,510mm (109" x 59.6")	2,790mm x 1,510mm (109" x 59.6")	2,790mm x 1,510mm (109" x 59.6")	2,790mm x 1,510mm (109" x 59.6")	2,790mm x 1,510mm (109" x 59.6")
Machine Weight		5,100kg(11,230Lbs.)	5,100kg(11,230Lbs.)	5,100kg(11,230Lbs.)	5,100kg(11,230Lbs.)	5,200kg(11,450Lbs.)

Others

Splash Guard Interlock, Coolant, Pneumatic Unit, Machine Light, Regular Hand Tools Kits & Box

Options

Collet Chuck System, Power Chuck System, Cut-off Confirmation, High Pressure Coolant, Revolving Tools and Drive Unit, Work Ejector, R-spindle Inner Coolant and air blow
Spindle Brake System(L&R-spindle), Air Blow, Parts Catcher and Parts Conveyor, Coolant Level Switch, Drill Breakage Detector, Chip Conveyor, Chip Box, R-spindle Through Parts Carrier
Magazine Bar Feeder, Signal Tower(3 steps)

The specifications are subject to change without notice, Standard equipment package may vary by region.
Machines in photos may not look exactly the same as the actual products.

EXTERNAL VIEW

■ BNJ-51SY2

330 290   1,945   225
13" 11.41" 76.57" 8.86"
2,790
109.84"

550
21.65"

1,720
67.71"
1,050
41.34"

90   1,420
35.4" 56"
1,510
59.45"

BNJ-34S2
BNJ-42S2
BNJ-34SY2
BNJ-42SY2
BNJ-51SY2

Miyano's innovative mechanical design makes it possible to perform high-end functions which other machines are not capable of Miyano machines offer efficient processing for complex work pieces completed in a single, highly productive setup, including simultaneous machining, off-center machining and Y-axis machining.

Miyano has made efforts to develop a Multi-purpose CNC Turning Center to perform high-end functions, which other machines are not capable of, as well as to develop machines which are compact in size and which can completely finish machine complex parts automatically in a single set up. Miyano has also been working to reduce the idle time step by step so as to reduce the production time to the shortest possible.

The L spindle, traditionally loaded with raw material by a barfeeder, is fixed whilst the opposing R spindle can move in the Z-axis direction to receive a first operation machined part from the L spindle. Miyano has designed the back working turret to have a unique segmental form. As a result of this a new concept for extremely efficient machining has been achieved.

By indexing the back working turret into a concave position ample clearance is created for the R spindle, which moves in both X and Z axis, to have access to rearward facing tools mounted on the main turret. This enables simultaneous machining to be carried out on both the L and R spindles.

This method reduces idle time and enables the completion of entire operations, including off-center and combined machining that other machines are not capable of.
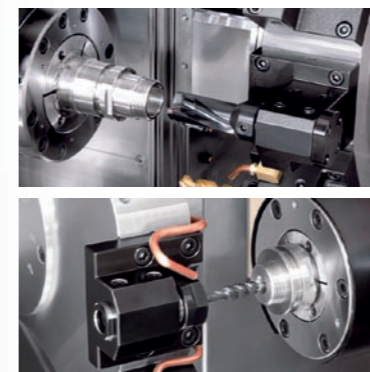

Simultaneous machining by main and back-working turrets

Simultaneous machining of work pieces on the L-spindle with the main turret and work on the R-spindle with the back working turret is the key to high efficiency.
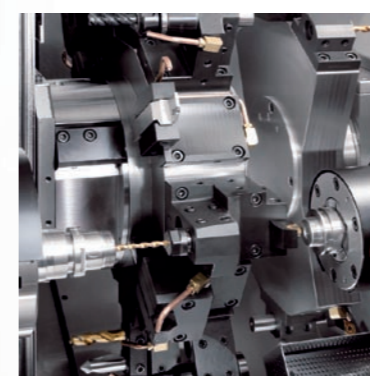
Simultaneous, overlapping machining for the front and back operations

Overlapping control, which enables the R-spindle to precisely follow the movement of the main turret, reduces machining time for operations such as turning operation and combined machining with the Double sided revolving tool.
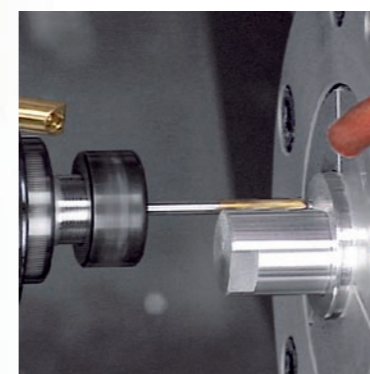
Off-center machining on the R-spindle

The off-center collet on the R-spindle enables off-center machining including combined machining such as crank machining which other machines are not capable of.
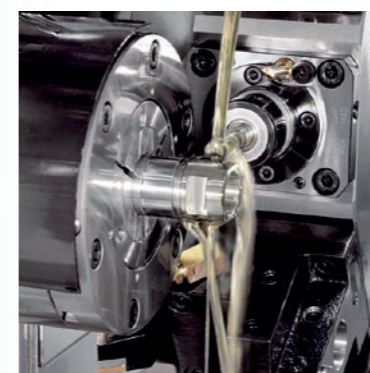
Combined machining on the Y-axis

The Y-axis function of the main turret enables side milling which previously required both C-axis and end milling. This also enables large diameter threading and machining of work pieces with large pockets and bosses which were previously difficult to machine.
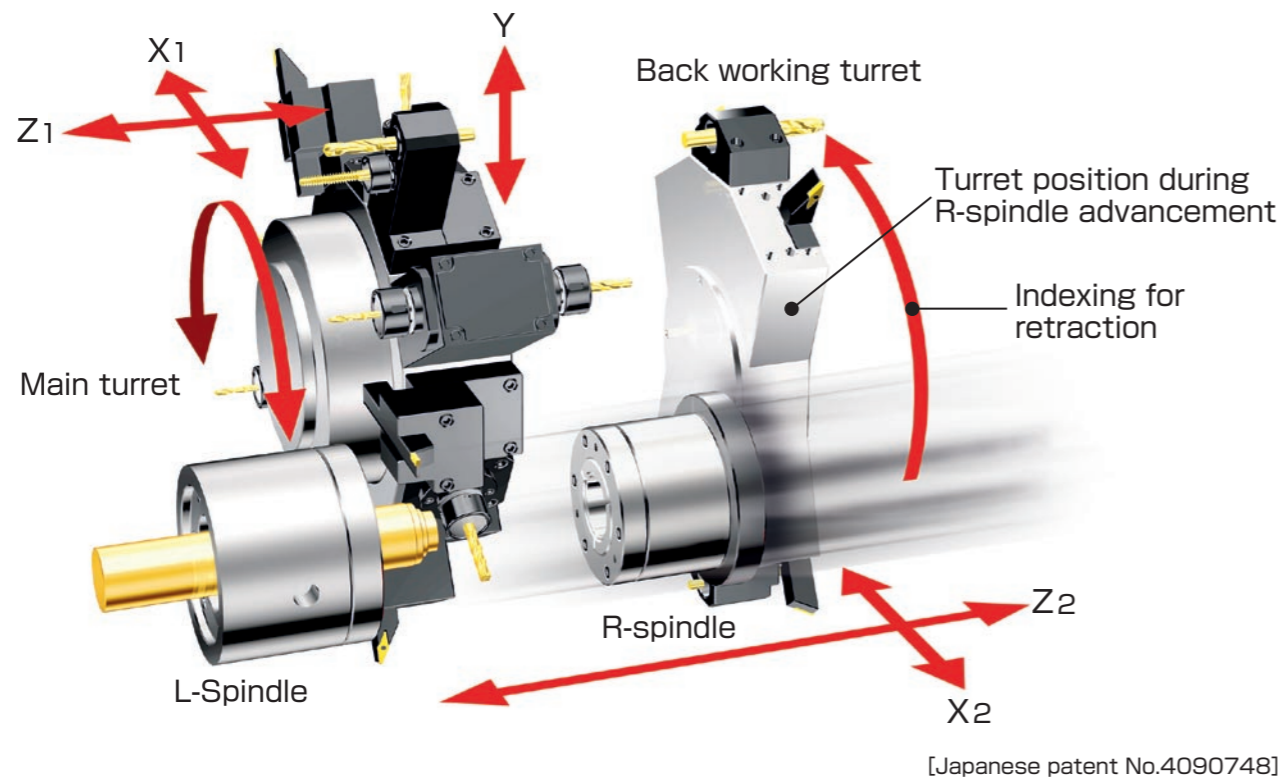
※ SY2 tipe only

Machining at full capacity starts immediately after indexing the back working turret and the entire operation is completed in a single process as a result of combined machining.
Cranks and off-center bushes can also be machined.

Machining at full capacity starts immediately after indexing the back working turret

The backworking turret has two concave sections. Immediately after this turret is indexed to a concave section, clearance is created to allow the R spindle to gain access to rearward facing tools mounted on the main turret and/or to collect the workpiece from the L spindle. This new innovation results in reduced idle times.

X1
Y
Z1
Back working turret
Turret position during R-spindle advancement
Indexing for retraction
Main turret
Z2
X2
R-spindle
L-Spindle

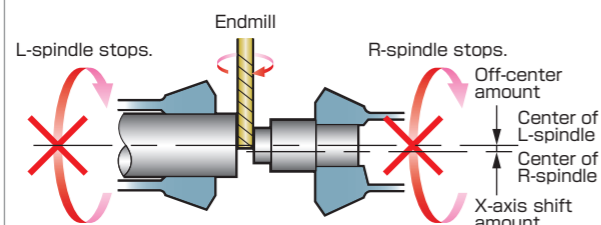[Japanese patent No.4090748]

Off-center machining by X-axis shift

The off-center collet is installed in the R spindle and the R spindle is shifted horizontally in the X-axis direction by the off-center dimension. Then the chuck centers of the L and R spindle are aligned. The R spindle traverses to the left and chucks the workpiece that has been partially parted off. The workpiece is fully parted off by using an end mill to allow the operation to begin. Off-center machining on parts such as cranks, bushes can begin on the R spindle. Double off-center machining can also be carried out manually.
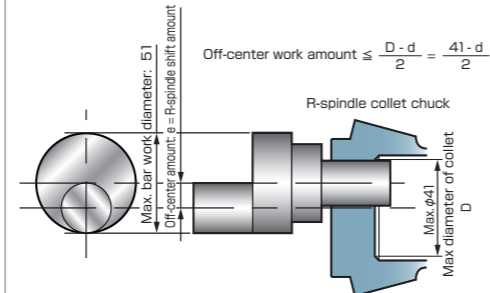
### ■ Examples of Machining   ■ Cut-off with endmill   ■ Reference of off-center amount

L-spindle stops.
Endmill
R-spindle stops.
Off-center amount
Center of L-spindle
Center of R-spindle
X-axis shift amount

$$\text{Off-center work amount} \leq \frac{D - d}{2} = \frac{41 - d}{2}$$

Off-center work amount: 51
Off-center amount a = R-spindle shift amount
Max. bar work diameter: 51
R-spindle collet chuck
Max. ϕ41
Max diameter of collet D

A wide variety of combined machining with revolving tools

■ Basic combined machining
In addition to conventional cross drilling, tapping and face tapping on the main spindle's center axis, a Y-axis allows for off-center drilling, tapping, and milling.
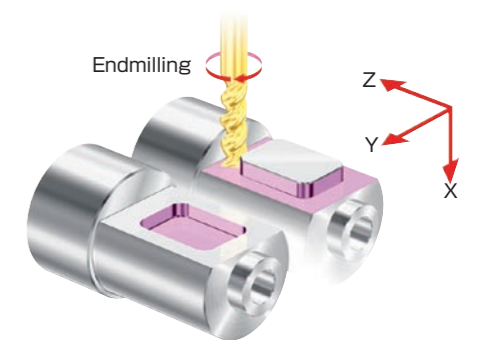
Endmill
Z
Y
X
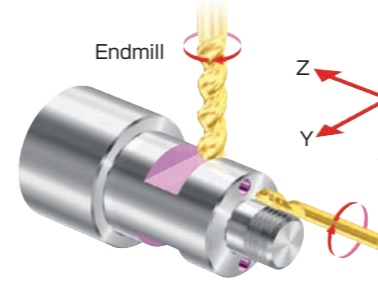
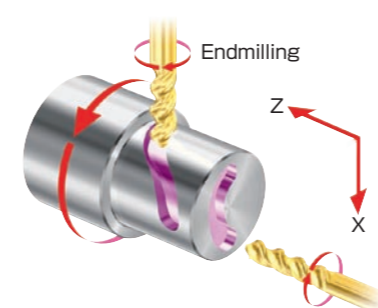### ■ Large Diameter Helical Threading
(Option)
Planetary tap
Z
Y
X
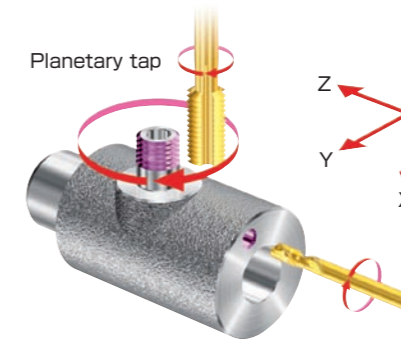
■ Milling of large pockets and bosses
Linear and circular interpolation makes it possible to machine large OD pockets and bosses on the Y-Z plane.

Endmilling
Z
Y
X

■ Contour Milling
Combining the C-, X-, and Z-axes makes it possible to do contour milling with simultaneous 3-axis control.

Endmilling
Z
X

■ Contouring milling + Off-center machining
One side is machined off-center by contour milling and the other side is machined off-center on the off-center chuck. Double off-center machining can be performed on the machine.
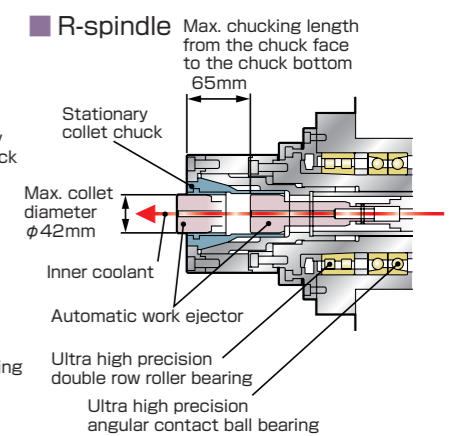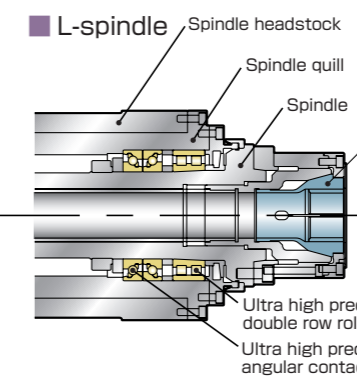
OD cutting tool
Z
X
Off-center
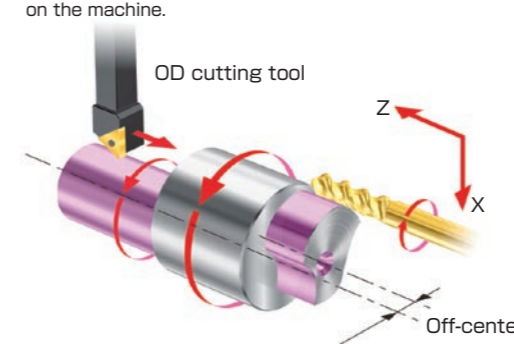
■ High precision milling
Accurate positioning by the C-axis and high precision combined machining by the Y-axis allow for a wider range of machining.

Endmilling
Z
Y
X
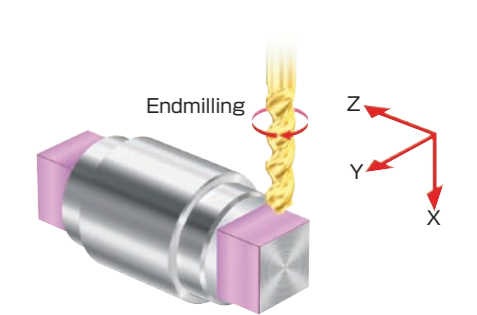
The L/R-spindles and tool spindles enable stable machining

Double row roller bearing and angular contact ball bearing used for the front bearing and double row roller bearing used for the back bearing are mounted in the quill housing for both L and R axes. This makes it possible to achieve sufficient rigidity, heat control, and flexible thermal distortion qualities to facilitate the production of high precision parts. Tool spindles are driven by a tough AC servo motor to achieve stable machining and overload protection.

■ L-spindle
Spindle headstock
Spindle quill
Spindle
Stationary collet chuck
Ultra high precision double row roller bearing
Ultra high precision angular contact ball bearing

■ R-spindle
Max. chucking length from the chuck face to the chuck bottom 65mm
Stationary collet chuck
Max. collet diameter ϕ42mm
Inner coolant
Automatic work ejector
Ultra high precision double row roller bearing
Ultra high precision angular contact ball bearing

■ Torque Diagram of Tool Spindle
Overload detection :
Continual machining area
Continuous machining area
Spindle torque
Tool spindle speed

■ L-spindle Power Diagram
11kW
82.5N·m   7.5kW
56.3N·m
30 minutes rating
Continuous rating
Spindle torque
Spindle motor output
Spindle speed

■ R-spindle Power Diagram
5.5kW
40.6N·m   3.7kW
27.3N·m
30 minutes rating
Continuous rating
Spindle torque
Spindle motor output
Spindle speed
Unusable range of ejector
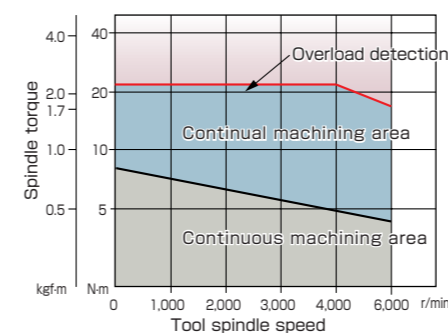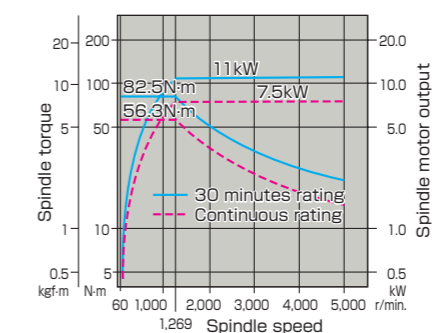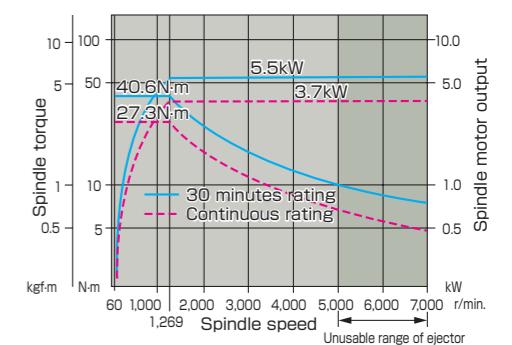
Various options

● Parts catchers and parts conveyors
are indispensable for bar work machining.

● Cut-off confirmation
This is a function to confirm that cut-off of the work piece is completed and the R-spindle can traverse with low thrust to the retract position for cut-off confirmation and program skip. The safety and reliability of this function makes it easier to avoid mechanical troubles.
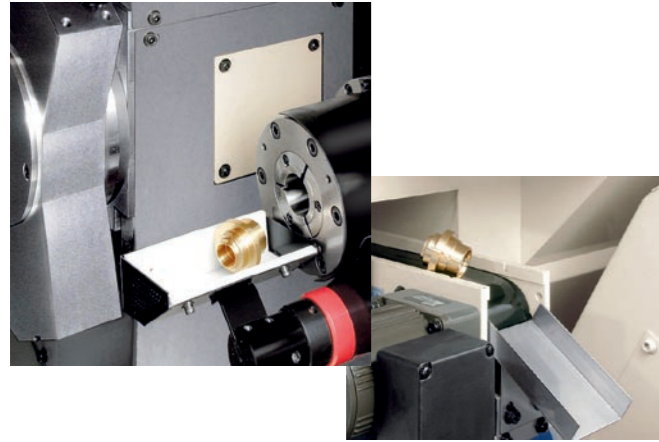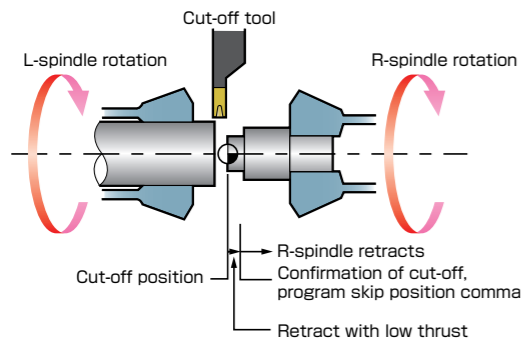
Cut-off tool
L-spindle rotation
R-spindle rotation
Cut-off position
R-spindle retracts
Confirmation of cut-off, program skip position comma
Retract with low thrust

● Revolving tools
The standard tooling is a simple setup consisting of an X-spindle unit and a Z-spindle unit. The rigid tapping function (optional) is used for tapping. The tapping collet is mounted only in special situations.
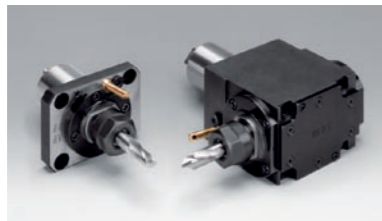
● Magazine bar feeders
Various types of magazine bar feeders, such as oil supports, are available to suit the needs of the customer.

● Chip conveyor
This chip conveyor is a universal hinge type. It enables high precision machining by smoothly carrying out large volumes of chips and eliminating chip heat generated during prolonged machining. A chip conveyor is the indispensable for prolonged operation. The ideal speed is set by the inverter to conserve energy. Please consult with us when using special work piece materials for machining.
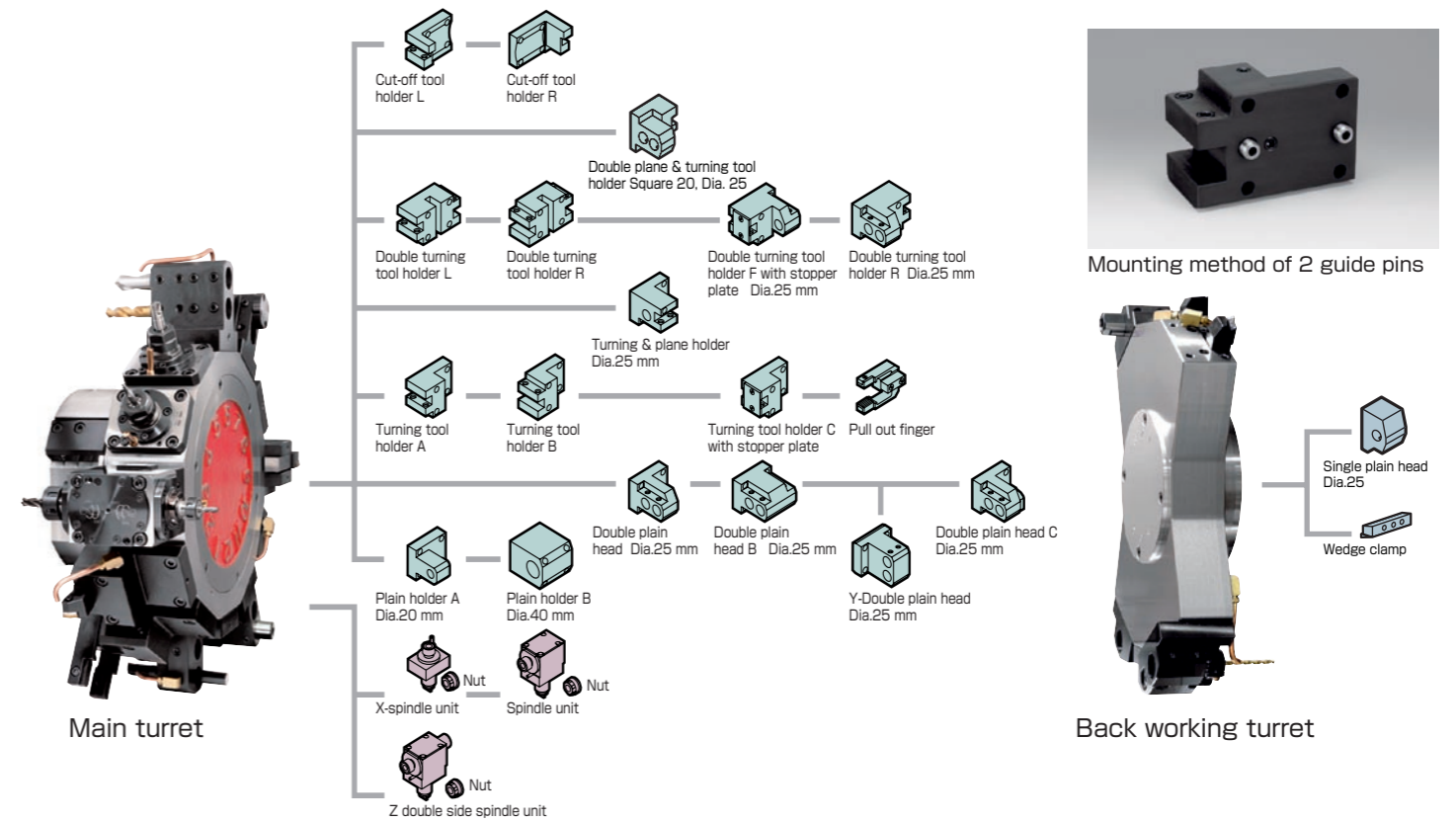
NC SPECIFICATIONS MIYANO-FANUC

● Simultaneously controlled axes	3 axes / 2 paths, X1,Z1,Y1,Cs1,A1(Rev. tools) / X2, Z2, Cs2
● Min. input increment	0.001mm, 0.0001 inch, 0.001 deg.
● Min. output increment	X-axis:0.0005mm, Z-axis: 0.001mm
● Parts program storage capacity	64 kb, 160m (525 feet)Tape length
● Spindle function	Spindle speed S5 digits direct specify, Constant cutting speed control
● Rapid traverse rate	X1,X2, axis:18m/min. (708ipm) , Z1,Z2,axis:20m/min.(787ipm) Y-axis 12m/min.(472ipm)
● Cutting feed rate	F3.4 digit direct specify
● Cutting feed rate override	0 ~150% (10% steps)
● Interpolation	G01, G02, G03
● Threading	G32, G92
● Canned Cycle	G90, G92, G94
● Work coordinate setting	Automatic setting, 32 sets by the geometry offset function
● Tool selection and work coordinate system selection	Tool selection 1 ~ 32 can be done by the first two digit of the T-4 digit code.
● Tool wear offset	Tool wear selection 1 ~ 32 sets can be done by the last two digit of the T-4 digit code.
● Direct input of tool positions	Measured value can be directly key in
● Input/Output interface	RS-232C, PC Card Slot.
● Automatic operation	Single/Continuous cycle operation. Single block operation, Block delete, Machine lock, Dry run, Feed hold.
● Others	

10.4" Color LCD, Decimal point input, Manual pulse generator, Memory protect, Start interlock, Manual Retrace Function, AC digital servo, 120 storage parts programs, Polar coordinate interpolation, Synchronous mixing feed function.

● Basic Options
Chamfering/Corner R control, Tool nose R compensation, Cs-axis control, Wear offset, Inch/Metric conversion
Constant cutting speed control, Background editing, Alarm display, Run hour/Parts count display

● NC Options
Multiple repetitive canned cycle(G70~G76), Custom macro B, Additional parts program storage (Total: 320m(1050feet), 640m (2100feet) 1280m (4200feet))
Cylindrical interpolation, Helical interpolation, Rigid Tapping Function (Spindle / Revolving Tools), Total & Preset Counter, Superimpose Feed Functions A, Programmable Data Input(G10), Continuous multi-lead thread cutting, Variable lead thread cutting, Tool life management system.

A tooling system that is ideal for bar work machining and abundant options for a wide tooling zone.

Tooling system

Since this model employs the same tooling system as the ABX series, the tool holders are completely compatible. Ideal tooling is achieved by selecting the most appropriate tool holders. When the bar feeder is not attached to the machine, a pull out finger chuck is available, which is commonly used for round bar, hexangular bar and square bar. The back working turret is a turret for back side machining. The OD cutting tool is directly mounted on the turret as a wedge and the ID cutting tool is mounted on the holder.

Cut-off tool holder L
Cut-off tool holder R
Double plane & turning tool holder Square 20, Dia. 25
Double turning tool holder L
Double turning tool holder R
Double turning tool holder F with stopper plate Dia.25 mm
Double turning tool holder R Dia.25 mm
Turning & plane holder Dia.25 mm
Turning tool holder A
Turning tool holder B
Turning tool holder C with stopper plate
Pull out finger
Double plain head Dia.25 mm
Double plain head B Dia.25 mm
Double plain head C Dia.25 mm
Y-Double plain head Dia.25 mm
Plain holder A Dia.20 mm
Plain holder B Dia.40 mm
Nut
X-spindle unit
Nut
Spindle unit
Nut
Z double side spindle unit

Main turret

Mounting method of 2 guide pins

Single plain head Dia.25
Wedge clamp

Back working turret

Tooling area

Turret length 320
Main turret
Y-axis slide Stroke
Spindle center
Main turret
Back working turret
Stationary collet
L-spindle
Stationary collet
R spindle

Type of machine	L-spindle		R-spindle	
	Collet	AA BB		Collet
BNJ-34Sₐ BNJ-34SYₐ	H-S16	φ148	φ120	H-S16
	DIN171E	φ115	φ85	DIN171E
BNJ-42Sₐ BNJ-42SYₐ	H-S20	φ145	φ120	H-S16
	DIN173E	φ115	φ120	DIN173E
BNJ-51SYₐ	H-S22	φ143	φ120	H-S16
	DIN177E	φ130	φ120	DIN173E