MIYANO MODEL BNJ-42SY
5-AXIS TWIN TURRET TWIN SPINDLE TURNING CENTER
W/REVOLVING TOOL ATTACHMENT & Y-AXIS

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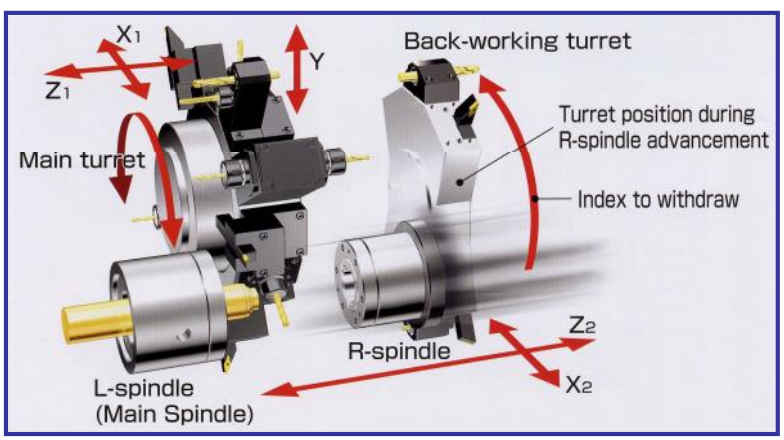
BNJ-42SY

1-5/8" Diameter bar capacity
3.9" Work length

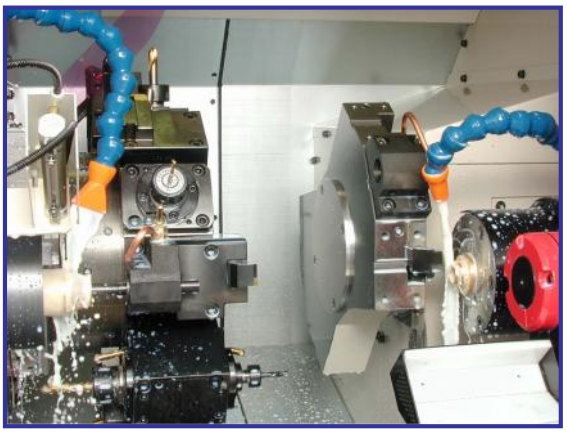
STANDARD FEATURES

FANUC 18i-TB control
12 Station main turret by servo indexing motor that can be tooled up to 48 tools
6 Station sub turret by servo indexing motor
Left spindle for first operation work
Right spindle for secondary operation work
67 to 5,000 RPM left and right spindle speed
15 Horsepower Fanuc AC left spindle drive motor
7.5 Horsepower Fanuc AC right spindle drive motor
0.2 Second/station turret indexing (main turret)
0.2 Second/station turret indexing (sub turret)
Bi-directional turret indexing on both main and sub turrets
Y-Axis on main turret
Left & right spindle synchronous control
Overlapping control for simultaneous machining
C-axis left & right spindle control
Rigid tap function for both spindles
Revolving tool attachment on main turret
3.3 Horsepower revolving tool drive unit
Left spindle stationary type for Hardinge-S20 collet pads
Right spindle stationary type for Hardinge-S16 collet pads
4-Axis simultaneous machining
First and secondary operation can be performed simultaneously
Free position indexing of each cutting tool
Left & right spindle orientation for hexagon and square bar work part transfer
Set of Miyano tool holders
Exclusive left and right spindle combination tool holders reduce turr et indexing
Inner high pressure (160 psi) coolant/air for right spindle
1-Year warranty on machine
2-Year warranty on Fanuc control



STANDARD ACCESSORIES

Flood coolant system
High-pressure coolant system for both turrets (160 psi)
Programmable part catcher
Part conveyor
Left spindle disk brake
Work ejector (Cylinder type) in right spindle
Cut-off confirmation
Total & preset counter
Signal tower, 3 steps
Automatic lubrication system
Built in work light
Air blow system for left spindle
Air blow system for right spindle
Splash guard door with safety interlock
Hand tools and toolbox
Instruction manual
Fanuc control manual
Parts list
Electrical diagram
Filler tube assembly
Leveling screws and plates



OPTIONAL EQUIPMENT

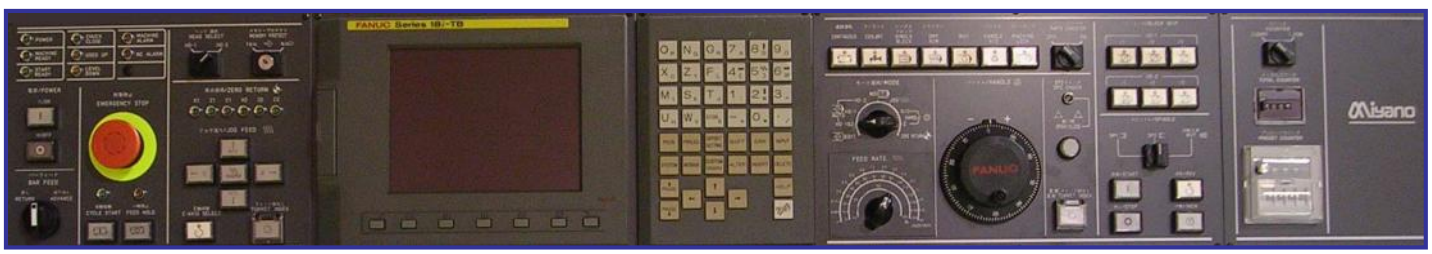
Long shaft work (LSW) (Max. 1-1/4" Dia. x 11-3/4" long)
1-5/8" Diameter left spindle stationary type for B&S #22D collets
1-5/8" Diameter right spindle stationary type for B&S #22D collets
Revolving tools for drilling, milling, and tapping for main turret only
5" Diameter 3-jaw chuck for left spindle
5" Diameter 2-jaw chuck for left spindle
4" Diameter 3-jaw chuck for right spindle
4" Diameter 2-jaw chuck for right spindle
Chip conveyor (Hinge type) Low (Required with LSW)
Chip conveyor (Hinge type) (Goose neck) (Not used with LSW)
Coolant level switch
Chip cart
460 Volt transformer
Additional part program storage
Miyano magazine bar feed interface
Miyano single bar feed interface
High-speed bar feed systems

MIYANO FANUC 18i-TB CONTROL
STANDARD FEATURES

5 axis control
Overlapping Function
Rigid tapping function for left and right spindles
Polar & cylindrical coordinate function
Synchronized mix control
Simultaneous control of two axes in the same direction (ex. main turret Z1 with right spindle Z2 - axis)
Least input increment 0.0001 inch
Least command increment 0.0001 inch
Machine lock on all axis
Door Interlock
Emergency stop
Expanded stored stroke check
Tool post interference check
Chamfering on/off
Backlash compensation
MDI operation
Sequence number search
Program number search
Dry run
Single block
Manual handle feed rate x1, x10

Positioning (G00)
Linear interpolation (G01)
Circular interpolation (G02, G03)
Dwell (per second) (G04)
Skip function (G31)
Reference point return (G28)
Reference point return check (G27)
2nd reference point return (G30)
Optional block skip
Rapid traverse override F0, 25, 50, 100%
Feed per minute inch/min (G98)
Feed per revolution inch/rev (G99)
Automatic acceleration/deceleration
Feed override 0 to 150%
Manual continuos feed
Thread cutting, synchronous feed (G 32)
Reset
Feed hold
Automatic coordinate system setting
Decimal point input
Programming input of offset data (G10)
Chamfering/corner R
Tool nose radius compensation (G40, 41, 42)
Canned cycles (G90, 92, 94)

Multiple repetitive cycles (G70-G76)
X-axis diameter/radius programming
Counter input of offset value
Radius designation on arc
EIA/ISO automatic recognition
Miscellaneous function M-3 digit
S-4/S-5 digit command single analog output
Constant surface speed control (G96)
Spindle speed orientation 50 to 120%
Tool function T2+2
Tool offset memory +6 digits, 32 pairs + 32 pairs
Tool geometry/wear offset
Direct input of offset value
Part program storage length 66 Ft. + 66 Ft.
Registered programs 63 pieces + 63 pieces
Program protect
Multi-language display English
Run hour and parts counter display
Display of spindle speed and T code at all screens
Actual speed display
Self-diagnosis function
Status display
Inch/metric conversion
Background editing
Custom Macro B for revolving tool rigid tapping
Reader/puncher interference by RS-232C
9” CRT/MDI (Full key type) high-resolution monochrome



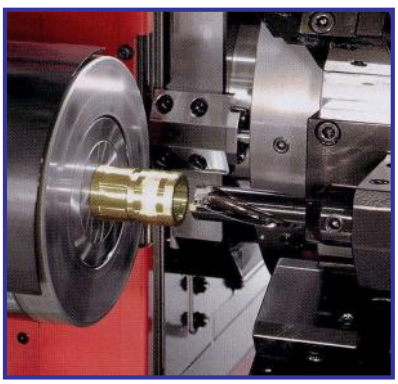
MAIN AND SUB TURRETS

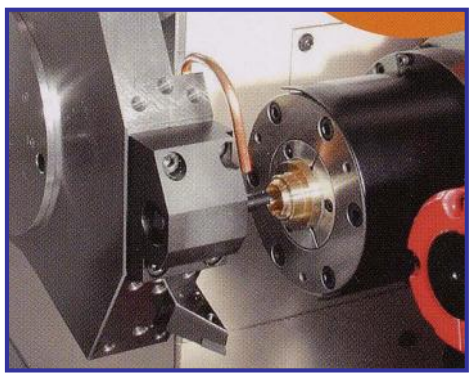
Two independently controlled turrets provide 5-axis machining capability. The main turret has 12-stations and the sub turret has 6-stations for machining the first operation on the left spindle and the second operation on the right spindle side to finish the part complete.

Main Turret

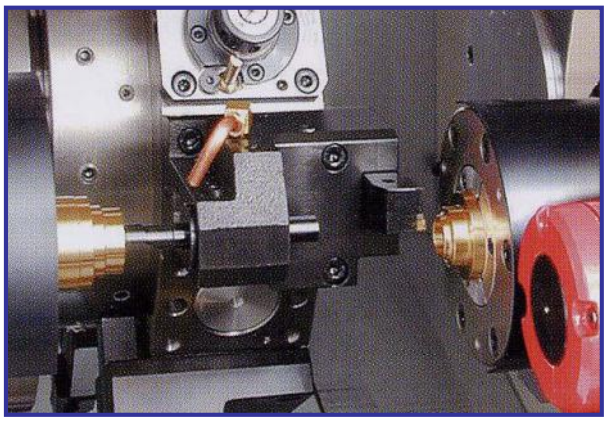
Sub Turret

There are several machining combinations utilizing the two turrets and two spindles that make it possible to overlap front and back side operations, thus reducing cycle time. The main turret can work on the left spindle and the sub turret can work on the right spindle at the same time. For example, drilling with main turret on left spindle and I.D boring with sub turret on the right spindle.

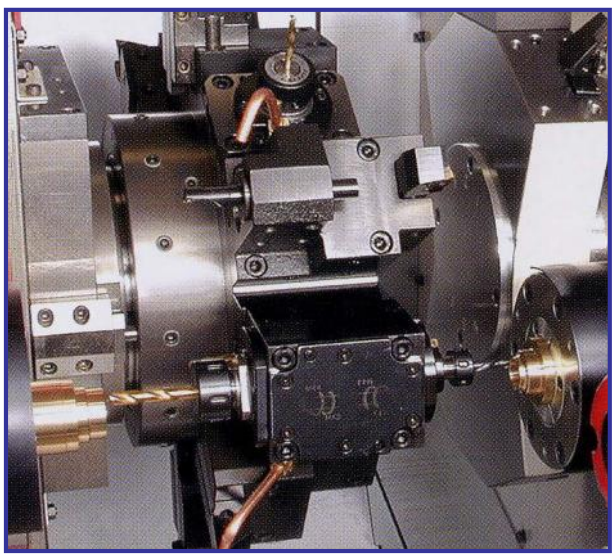




Additionally, the main turret can work on both the left and right spindles simultaneously by utilizing the standard overlapping function B. The overlapping function makes 4-Axes simultaneous machining possible by utilizing a Miyano combination tool holder on the main turret. For example, the main turret can be boring on the left spindle while the right spindle is following a turning tool also mounted on the main turret thus producing the correct turning profile. This can be done by simple programming technique.



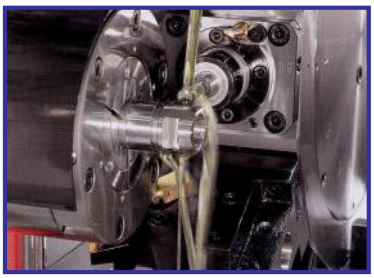
Cutting tools can be mounted on both sides of the main turret when utilizing the Miyano combination tool holders. These exclusive tool holders and flexible tooling selection combined with free position turret indexing, allow each cutting tool on the main turret to be indexed anywhere around the part, and permits more efficient programming that can substantially reduce cycle time. The main turret can perform cutting operations on the right spindle side as well. For this to take place the sub turret must index in to a specific position so that the right spindle can move into position near the main turret. This makes it possible then for the main turret to do revolving tool work on the right spindle, since the sub turret is not equipped for revolving tools.



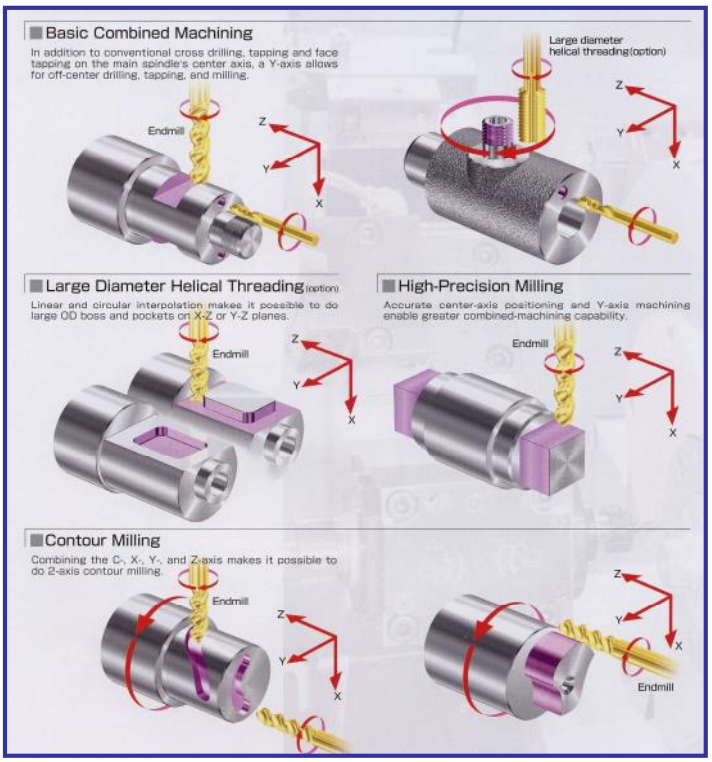
The six station sub turret exclusively works on the right spindle. It is a fixed position turret which only indexes static tools such as turning, drills, boring bars, single point treading, and taps into position. Once the sub turret is in position, the right spindle moves the chucked part past the tool in the X2 & Z2 axes to produce the secon dary operation work. The sub turret must index into a specific position so that the right spindle can move past it. This way the spindle can move into the work area where machining with the main turret or picking up a part being cut off from the left spindle takes place.

The main and sub turrets provide fast station to station indexing of 0.2 second, respectively. Bi - directional turret indexing allows the turrets to automatically take the shortest path to the next selected cutting tool station. The mai n and sub turrets are interference free, providing ample clearance between each tool station and the workpiece, allowing any combination of O.D. or I.D. tools to be used.

TURRET Y-AXIS CONTROL

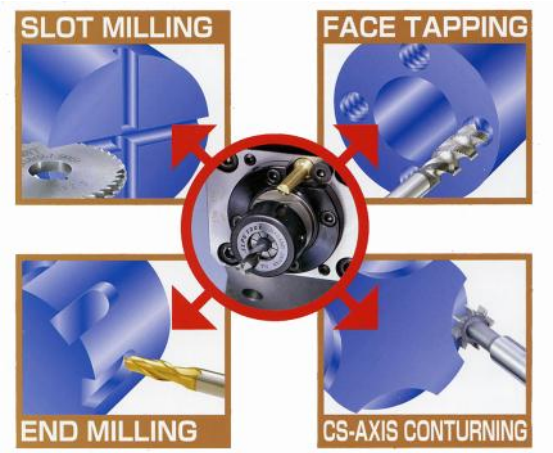


Y-axis for machining is standard with the BNJ -42SY machine. The CNC program moves the turret along the Y - axis slide to perform more complex milling and parallel hole drilling/tapping operations both above and below (+/ - 1.18" stroke) spindle center line when the optional live tools are used. Standard left spindle d isk brake can be engaged to provide extra resistance to spindle rotational movement while performing Y -Axis machining. Similar to the other axis, a ball screw and servomotor drive this Y -axis slide. Now, more complicated machining from the 1 -5/8" bar and under is possible to be able to finish the parts complete in one set up.



REVOLVING TOOL ATTACHMENT MAIN TURRET

The revolving tool attachment to the main turret allows multiple machining operations to be performed by using live revolving tools. The optional revolving tools allow cross/end drilling, tapping, and milling operations to be performed on a part to finish it complete in one set-up on the machine. Parts are completed in one continuous cycle. The main turret accepts six revolving tools, providing a wide selection of machining capability on the left and right spindles. Both spindles are equipped with C-Axis spindle positioning, which provides indexing in 0.001 degree increments. Programmable revolving tool spindle speed range is from 0 to 4000 RPM. A 3.3 horsepower AC motor is used to drive the revolving tools.



LEFT & RIGHT SPINDLE C-AXIS CONTROL

The left and the right spindle are equipped with a C-axis control for 5-axis machining. The C-axis combined with the right spindle work transforms the machine into a MANUFACTURING CELL that produces complex parts in one set up. The spindles C-axis movement can be combined with either X or Z-axis to perform milling operation on the outside diameter of the part. The spindle C-axis movement is controllable from 0.001 degree to 360 degree at any desirable feed rate. Complex machining can be performed in one set up on the part eliminating the need for a secondary operation. Polar and cylindrical coordinate functions are standard with the C-axis to program complicated contours by giving a minimum point, almost eliminating the need for a CAD system and complex calculations.

LEFT SPINDLE DRIVE

A 15 horsepower maximum rated Fanuc AC wide range spindle drive motor with a spindle speed range from 67 to 5000 RPM provides an infinitely variable spindle speed selection through direct RPM spindle programming. The AC spindle drive motor allows powerful cutting throughout the RPM range.

RIGHT SPINDLE AND CYLINDER T YPE WORK EJECTOR

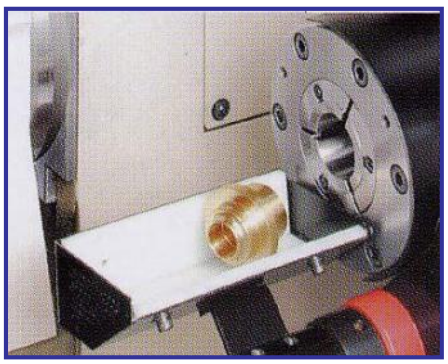
The right spindle is powered by a 7.5 horsepower Fanuc AC spindle drive motor with an infinitely variable spindle speed range from 67 to 5000 RPM. The right spindle is mounted on a heavy duty hand scraped, hardened, and ground slides. Th e slides are positioned by an additional servo motor that allows precise positioning along the X2 & Z2 -axis.

Upon completion of the first side of a part by the left spindle, the right spindle synchronizes to the same RPM as the left spindle for pickup and then cutoff operation is performed. This operation can also be performed with constant surface speed command, allowing improved tool life. The right spindle allows various secondary operations such as turning, boring, facing, and threading (single point and tapping) to be completed on the cutoff side of the part. After machining is completed, a CNC controlled pneumatic air cylinder type work ejector ejects the finished part out of the right spindle into a parts catcher. Therefore, maintaining complete m achining of the part in one set up. Consequently, first and second operation machining is completed at the same time, thereby reducing total part cycle time by as much as 40%.

This right spindle configuration is excellent for parts that require first and second operation machining. It provides the capability to finish a complete work piece from bar stock in one continuous cycle.

PROGRAMMABLE PARTS CATCHER WITH PARTS CONVEYOR

The parts conveyor operates in conjunction with the parts catcher to maintain u ninterrupted bar work production. After machining the backside of the work piece on the right spindle, the part is ejected into the parts catcher by the cylinder type work ejector. The catcher then places the finished work piece onto the conveyor where i t is transferred outside of the machine into a parts pan.



FLOOD COOLANT SYSTEM

A standard coolant pump is provided for coolant flow over the left spindle and the right spindle to help flood the work piece with coolant. A coolant line is a lso connected to the back of the right spindle to help flush chips. The pump supplies a pressure of 60 PSI.

HIGH PRESSURE COOLANT SYSTEM

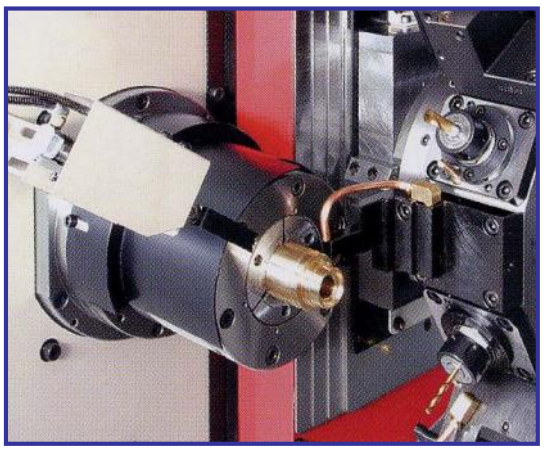
A 160-PSI high-pressure coolant is fed through the turret for the station in use to the tip of the cutting tool. The program controls the coolant start/stop. The high-pressure coolant system operates independently from the flood coolant system for maximum chip flushing. This high pressure is supplied to help increase tool life to reduce machine down time.

TOTAL AND PRESET COUNTER

The total and preset counter allows a pre-determined number of parts to be manufactured and then stops the machining cycle. The preset counter can also be used as an aid in production control and tool life management. The total counter will maintain a record for the number of parts machined in that production run.

CUT-OFF CONFIRMATION

The cut-off confirmation feature allows the machine, through use of a mechanical sensor, to physically check that part cut-off has actually occurred. If for any reason the part has not been cut-off, due to cut-off tool breakage for example, the cut-off confirmation feature will immediately stop the machining cycle.



LEFT AND RIGHT SPINDLE SYCHRONOUS CONTROL

Both spindles are synchronized through out the RPM range during the pick off operation. This feature allows the transfer of parts from left to right spindle without any marking on the part. Round, hex, or square material can be transferred without stopping both spindles therefore reducing machining time.

COLLET SYSTEM

The left & right spindle collet systems accept the Hardinge-S20 and Hardinge-S16 collet pads respectively. The left and right spindles can also be equipped for other optional collet systems.

MIYANO FANUC 18i-TB CONTROL

Miyano simplifies 5-axis programming with the latest control technology by using separate programs for the main and sub turrets, and the simultaneous operation of these programs with M -codes.

Miyano's work coordinate system setting function automatic ally sets the tool indexing position for both the main and sub turrets, simplifying programming and tool set -up, and reducing machining time. Free position turret indexing allows each turret station to be indexed anywhere along the slide axes, either in front or alongside of the work piece. By specifying only the tool number (T-code) and the indexing position in the program, the tool indexing position is automatically set. Cutting tool approach distance is shortened and chip -to-chip time is kept to a minimum.

Tool geometry offset programming provides easy programming and tool setting on the machine. Tool settings have been simplified and setup time reduced. The operator simply takes a trial cut on the work piece, measure the cut diameter or length, and inputs this measurement value by MDI (Manual Data Input) to the CNC control. The control position of the cutting tool.

Standard control features include 5-axis programming, constant cutting speed control, decimal -point programming, corner chamfering and c orner rounding, multiple repetitive cycles, canned cycles, manual pulse generator, tool nose radius compensation and RS232C (Serial) interface for remote data input and output.

STANDARD TOOL HOLDER PACKAGE

Qty.	Part No.	Description	Turret
(2)	1X78010A	Turning Holder A	Main
(2)	1X78040A	Double Plain Head A	Main
(2)	1X78420A	Double Plain Head B	Main
(1)	1X78430A	Double & Turning Holder F	Main
(1)	1Y78410A	Cut-Off Tool Holder	Main
(1)	1X78410A	Double Turning Holder	Main
(1)	1X78440A	Double & Turning Holder R	Main
(2)	1X78460A	Double Turning Holder	Main
(1)	1X780320	Stopper Plate	Main
(3)		Wedge Block Assembly	Sub
(1)	2KGS3900	Offset Single Plain Head	Sub
(2)	2K74900B	Single Plain Head	Sub
(1)	5W78500A	Round Hole Bushing (1/4”)	Used with Single Plain Head
(1)	5W78510A	Round Hole Bushing (3/8”)	Used with Single Plain Head
(1)	5W78520A	Round Hole Bushing (1/2”)	Used with Single Plain Head
(1)	5W78530A	Round Hole Bushing (5/8”)	Used with Single Plain Head
(1)	5W78540A	Round Hole Bushing (3/4”)	Used with Single Plain Head

Turning Holder A
(1X78010A)

Double Plain Head A
(1X 78040A)

Double Plain Head B
(1X78420A)

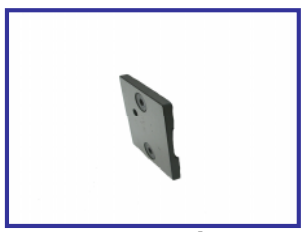
Double & Turning Holder F
(1X78430A)

Cut-Off Tool Holder
(1Y78410A)

Double Turning Holder
(1X78410A)

Double & Turning Holder R
(1X78440A)

Double Turning Holder
(1X78460A)



Stopper Plate
(1X780320)

Wedge Block Assy.

Offset Single Plain Head
(2KGS3900)

Single Plain Head
(2K74900B)

Note: Actual tool holders may differ slightly from those shown above. Tool holders shown above accept ¾” x ¾” shank & 1.0” diameter tooling.

STANDARD TOOL HOLDER PACKAGE

Round Hole Bushing
(5 Piece Set)

Note: Actual tool holders may differ slightly from those shown above. Tool holders shown above accept ¾" x ¾" shank & 1.0" diameter too ling.

OPTIONAL REVOLVING TOOLS

Part No.	Description	Turret	Drill/Mill Collet / (Max Capacity)	Tapping Collet
2K700001	X-Drill/Mill	Main	ER20 / (13mm)	ET1-20
2K701001	Z-Drill/Mill	Main	ER20 / (13mm)	ET1-20
2K704001	Y-Spindle Unit	Main	ER16 / (10mm)	N/A
2K705001	Slot Mill Unit	Main	N/A / (3.0” Diameter Saw)	N/A
2K703000	Z Double Spindle Unit	Main	ER20 & ER11 / (13mm & 7mm)	ET1-20 & N/A

X-Drill/Mill
(2K700001)

Z-Drill/Mill
(2K701001)

Y-Spindle Unit
(2K704001)

Slot Mill Unit
(2K705001)

Z-Double Spindle
(2K703000)

Note: Actual revolving tools may differ slightly from those shown above.

CHUCK (OPTION)

The BNJ series can be equipped with an optional 5" diameter high -speed 2 or 3-jaw hydraulic chuck for the left spindle. The right spindle can be opti onally equipped with a 4" diameter high-speed 2 or 3-jaw hydraulic chuck. Changeover from bar work to chuck work can be performed in 20 minutes. Concentricity is accurate to .0005" T.I.R. and can be operated up to 5000 RPM.

COOLANT LEVEL SWITCH (OPTION)

The optional coolant level switch will monitor the machine's coolant level during operation. If the coolant falls below a sufficient level for proper tool and part cooling, the machining cycle will stop.

CHIP CONVEYOR (OPTION)

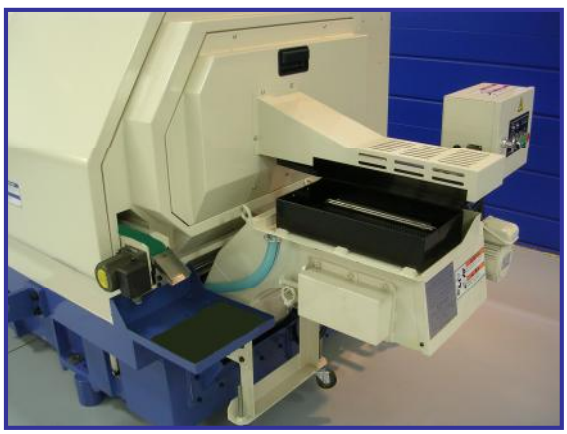
A chip conveyor is availa ble to provide automatic chip disposal. When equipped with the chip conveyor, chips are channeled out of the machine into an optional chip cart to provide a clean machining environment. Miyano can supply one of two optional chip conveyors. The first type is the Goose Neck (Hinge Type). The Goose Neck chip conveyor has a discharge height that allows customers to place a 55 gallon drum underneath to catch chips for disposal. The second type is a low type conveyor which is required if a long shaft work sys tem is used. The low type has a discharge height of 24" that the optional chip cart will fit under. Other optional custom chip conveyors are available upon special request.

HIGH SPEED BAR FEED SYSTEMS (OPTION)

A variety of hydrodynamic bar feed systems can be used with the BNJ-42SY. Refer to our recommended selection of bar feeders.

LONG SHAFT WORK (LSW) (OPTIONS)

The long shaft work options allows 1-1/4" diameter parts up to 11-3/4" long to be completely machined from bar stock in a continuous singl e operation. The shaft is swallowed through the right spindle and transferred into a long shaft bucket to the outside of the right spindle. Depending on the cutting condition, the machine is capable of machining a shaft of up to 2 feet in length (Will require modification of LSW tray). When equipping machine with the long shaft work system, a low type chip conveyor is required if customer desires to have a chip conveyor.



MACHINE INSTALLATION

At your plant facility, machine installation and start-up service is provided by a factory-trained service engineer who will assist in the set-up and production of your first part run.

WARRANTY

Miyano warrants the machine, FANUC control and the products furnished to be free from defects in material and workmanship for one year (2 years on FANUC control) from date of delivery to the original purchaser if given normal and proper usage, care and maintenance.

MODEL BNJ-42SY SPECIFICATIONS

BAR WORK

Round collet capacity ..... 1-5/8”

CHUCK WORK

Chuck size (left spindle) ..... 5”
(right spindle) ..... 4”

WORK LENGTH

Maximum work length ..... 3.9”

MACHINING CAPACITY

Maximum turning diameter (left spindle) ..... 5”
(right spindle) ..... 4”
Swing diameter of turret
Main ..... 22.4”
Sub ..... 17.32”

LEFT SPINDLE

Collet capacity ..... 1-5/8”
Spindle speed range (infinitely variable) ..... 67 to 5,000 RPM
Variable speed steps ..... Direct drive
Spindle drive motor (30 minute rating) ..... AC 15 HP
Motor Type ..... AC type
Spindle nose ..... Flat

RIGHT SPINDLE

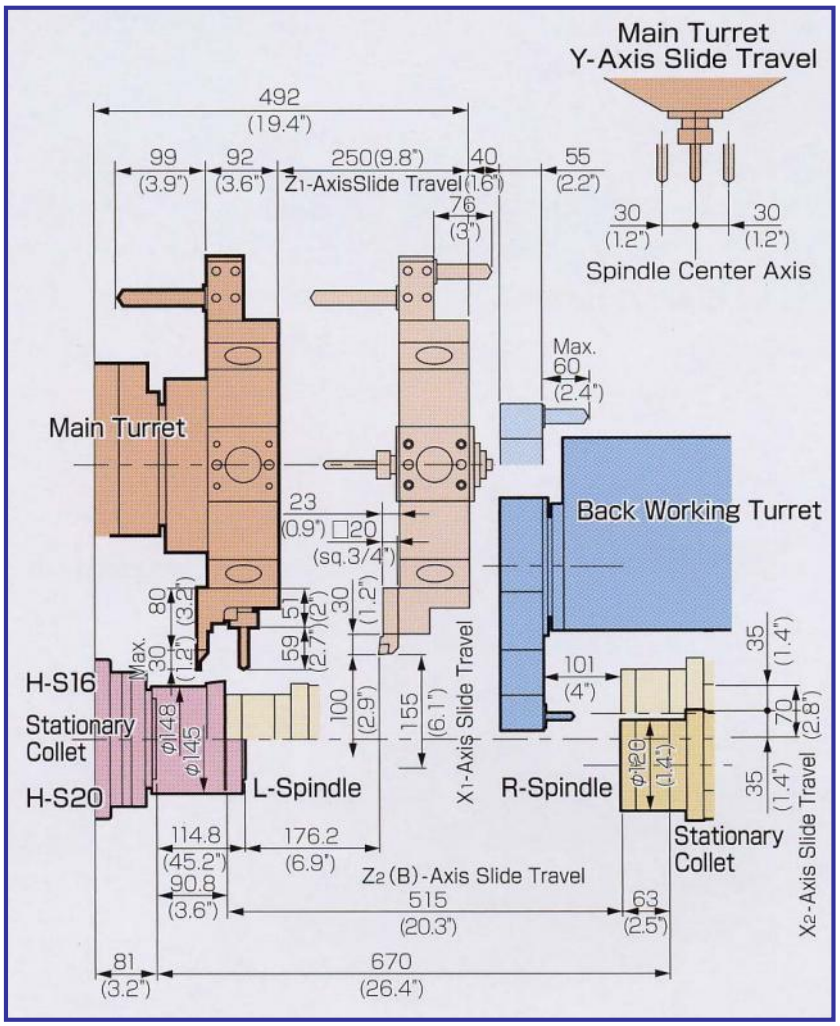
Collet capacity ..... 1-5/8”
Spindle speed range (infinitely variable) ..... 67 To 5,000 RPM
Spindle drive motor (variable speed) maximum rating ..... AC 7.5 HP
Spindle nose ..... Flat
Slide movement (X2 & Z2-axis) ..... NC Control
Slide stroke (X2-axis) ..... 2.75”
Slide stroke (Z2-axis) ..... 20.27”
Rapid traverse rate (X2-axis) ..... 708 IPM
Rapid traverse rate (Z2-axis) ..... 787 IPM

MAIN TURRET

Number of tool stations 12
Maximum slide stroke (X1-axis) ..... 5.59”
(Z1-axis) ..... 9.84”
(Y1-axis) ..... +/-1.18”
Rapid traverse rate (X1-axis) ..... 708 IPM
(Z1-axis) ..... 708 IPM
(Y1-axis) ..... 472 IPM
Turret indexing time ..... 0.2 Sec/pos.
Turret indexing type ..... Bi-directional

SUB TURRET

Number of tool stations 6
Turret Movement Classification (Index only)……Fixed Position
Turret indexing time ..... 0.2 Sec./pos.
Turret indexing type ..... Bi-directional



PARTS CATCHER

Maximum part diameter ..... 1-5/8”
Maximum part length ..... 3.9”

REVOLVING TOOL ATTACHMENT MAIN TURRET

Number of positions 6
Drive motor maximum rating ..... AC 3.3 HP
Speed range (infinitely variable) ..... 0 to 4,000 RPM
Revolving tool axes ..... X and Z

C-AXIS SPINDLE CONTROL (LEFT & RIGHT)

Spindle positioning ..... 360 Degrees
Minimum command increment ..... 0.001 Degree
Positioning system ..... C-axis control built in motor
Simultaneous 2-axis movement……. (X1-C1) or (Z1-C1) or (X2-C2) or (Z2-C2)
C-axis repeatability ..... +-0.017 Degree
C-axis positioning accuracy ..... +/- 0.2 Degree
Rapid feed rate…… 33 RPM

CHUCK (OPTION)

Chuck diameter (left spindle) ..... 5”
(right spindle) ..... 4”
Type ..... Hydraulic
Model ..... Kitagawa
Maximum speed ..... 5,000 RPM
Concentricity total indicator reading…….. 0.0005”

TURRET TOOLING

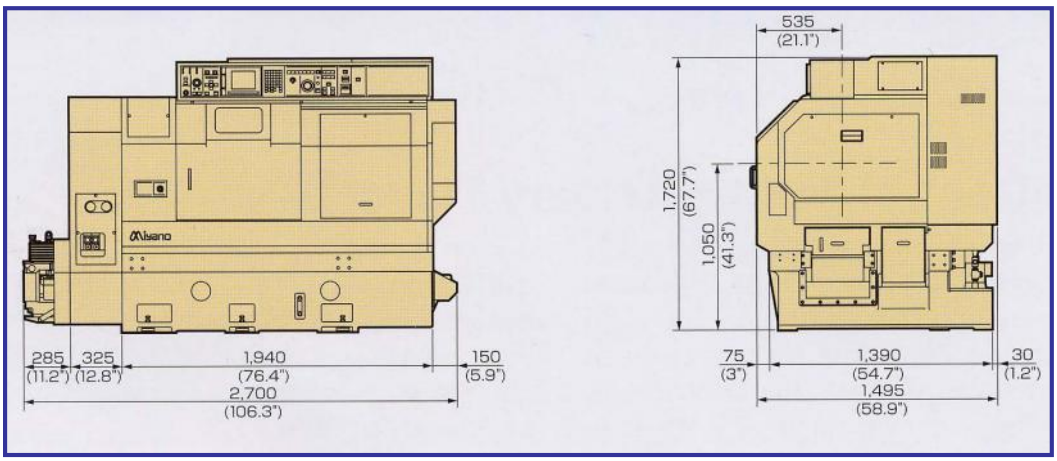
Cutting tool size (main turret) ..... 3/4” Sq.
(sub turret) ..... 3/4” Sq.
Tool holder diameter (main turret) ..... 1”
(sub turret) ..... 1”

GENERAL SPECIFICATIONS

Power required ..... 45 KVA
Voltage required …….. AC 200 / 220 V
Amperage required ..... 100 Amp
Compressed air required ..... 80 PSI

MACHINE DIMENSIONS

Width ..... 58.9”
Height ..... 67.7”
Length ..... 106”
Machine weight ..... 10,140 Lbs.



TERMS: 10 % down with order, balance net 30 days after delivery

Order: The end user customer is to place their purchase order to:
Miyano Machinery, Inc.
940 N. Central Ave.
Wood Dale, IL 60191

FOB: Point of shipment – Wood Dale, IL or US Port of Entry

Specifications and prices are subject to change without notice.

The fulfillment of accepted orders is contingent on accidents, fire, strikes, or other causes beyond our control.

Thank you for the opportunity to quote on your machining requirements.

Sincerely,

Miyano Machinery, Inc.