MIYANO MODEL BNE-51SY5
6-AXIS CNC SLANT BED
TURNING CENTER W/Y-AXIS SLIDE, W/SUB SPINDLE
& REVOLVING TOOLS

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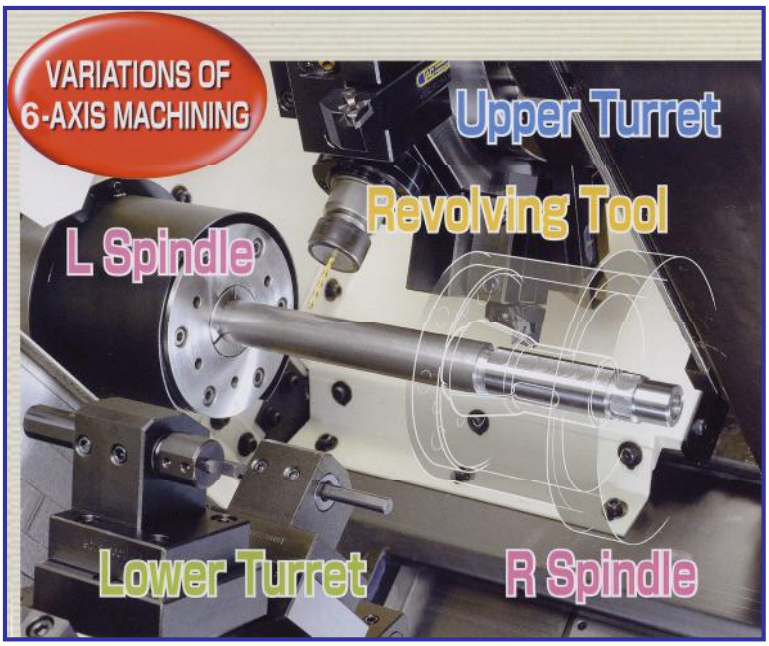
TURNING CENTER W/SUB SPINDLE & REVOLVING TOOLS

BNE-51SY5

2” Diameter bar capacity
1-5/8” Collet capacity for sub spindle
3-1/2” Work length

STANDARD FEATURES

FANUC 30i-TA control for 6 axis control
12 Station Identical upper and lower turrets by servo indexing motor
Each tool station on upper and lower turrets is live tool capable
Main spindle for first operation work
Sub spindle for secondary operation work
67 to 5000 RPM main spindle
67 to 5000 RPM sub spindle (7,000 RPM max without work ejector)
20 Horsepower Fanuc AC main spindle drive motor
7.5 Horsepower Fanuc AC sub spindle drive motor
0.25 Second/station turret indexing (upper turret)
0.25 Second/station turret indexing (lower turret)
Bi-directional turret indexing
Main & sub spindle synchronous control
C-axis main & sub spindle control
Y-Axis slide on upper turret
0-4,000 RPM upper and lower turret revolving tool speed
Servo driven revolving tools make rigid tapping possible with upper and lower turrets
Revolving tool attachment for live main and sub turret tooling
3.33 Horsepower drive unit for upper and lower turret live tool ing



STANDARD FEATURES

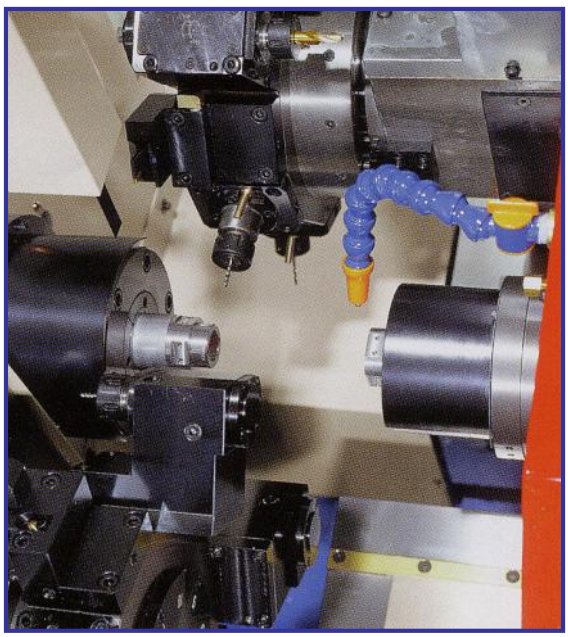
H-S22 main spindle collet system for bar work
H-S16 sub spindle collet system for bar work
Automatic work piece transfer from main to sub spindle
Sub spindle provides the capability to finish both sides of a work piece from bar stock
6-Axis simultaneous machining
First and secondary operation can be performed simultaneously
Chuck work can be machined simultaneously by both the main and sub spindles
One turret can be indexing while the other is machining parts to reduce idle time
Cycle time of a complicated part can be reduced by as much as 50 %
Increased productivity machining over 2, 3, and 4 axis machine
Free position indexing of each cutting tool
Slant bed design provides extra rigidity for heavy machining
Main & sub Spindle orientation for hexagon and square bar work part transfer
Signal tower 3-step
Set of Miyano tool holders
Exclusive main and sub spindle combination tool holders reduce turret indexing
Inner sub spindle coolant B
1-Year warranty on machine
2-Year warranty on Fanuc control

STANDARD ACCESSORIES

Flood coolant system
High-pressure coolant system
Programmable part catcher
Part conveyor
Work ejector (Air cylinder type)
Cut-off confirmation
Total & preset counter
Automatic lubrication system
Built in work light
Splash guard door with safety interlock
Hand tools and toolbox
Instruction manual
Fanuc control manual
Parts list
Electrical diagram
Leveling screws and plates

OPTIONAL EQUIPMENT

Long shaft work (LSW)
Revolving tools for drilling, milling, and tapping for upper and lower turrets
6” Diameter 3-jaw chuck for main spindle
6” Diameter 2-jaw chuck for main spindle
4” Diameter 3-jaw chuck for sub spindle
Chip conveyor (Hinge type) Low (Required with LSW)
Chip conveyor (Hinge type) (Goose neck) (Not used with LSW)
Coolant level switch
Air blow system for sub spindle
460 Volt transformer
Additional part program storage
High-speed bar feed systems
Background editing
Graphic display



MIYANO FANUC 30i-TA CONTROL
STANDARD FEATURES

8 axis control
Upper and lower turrets balance turning
Synchronized mix control
Simultaneous control of two axis in the same direction (e.g. upper Z with sub spindle B -axis)
Controlling two turrets working on a part from two different directions
Least input increment 0.0001 inch
Least command increment 0.0001 inch
Machine lock on all axis
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 (G32)
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

MIYANO FANUC 30i-TA CONTROL
STANDARD FEATURES

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 geometry/wear offset
Direct input of offset value
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
Reader/puncher interference by RS-232C
10.4" CRT/MDI (Full key type) full color screen
Polar coordinate interpolation
Cylindrical interpolation
Part program storage 160m + 160m
Tool offset pairs 64 pairs + 64 pairs
Work coordinate system 1-6 (G54-G59)
Tool Monitoring System/Torque Skip System

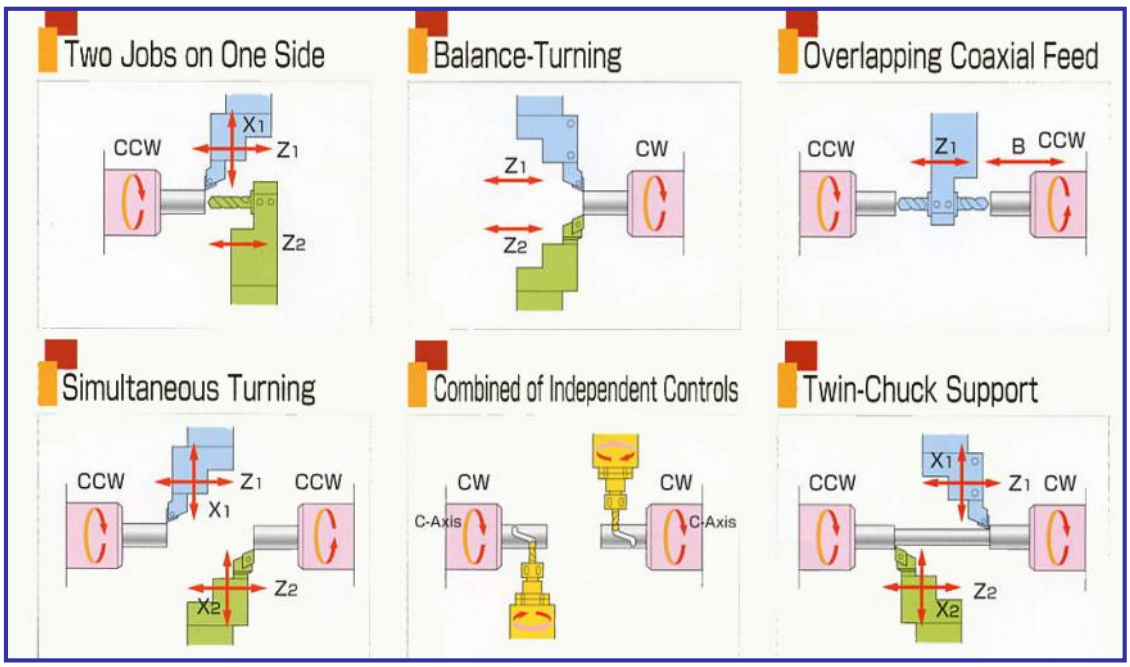
UPPER AND LOWER TURRETS

Two independently controlled upper and lower turrets provide 6 -axis machining capability. The upper and lower turret are identical 12 station turrets for machining the first operation on the main spindle and the second operation on the sub spindle side to finish the part complete.

The turrets can work simultaneously on the main spindle or they can work on the main spindle and sub spindle separately at the same time. For example, simultaneous O.D turning with upper turret and I.D. boring with lower turret on the main spindle side provides reduced cycle times because idle time is reduced when one turret is indexing, or rapid traversing while the other is machining the part.

Cutting tools can be mounted on both sides of either turret for machining on both the main and sub spindles. These exclusive tool holders and flexible tooling selection combined with free position turret indexing, allow each cutting tool on both the upper and lower turrets to be indexed anywhere around the part, and permits more efficient programming that can substantially reduce cycle time.

The upper and lower turrets provide fast station to station indexing of 0.25. Bi -directional turret indexing allows the turrets to automatically take the shortest path to the next selected cutting tool station. The upper and lower turrets are interference free, providing ample clearance between each tool station and the work piece, allowing any combination of O.D. or I.D. tools to be used.

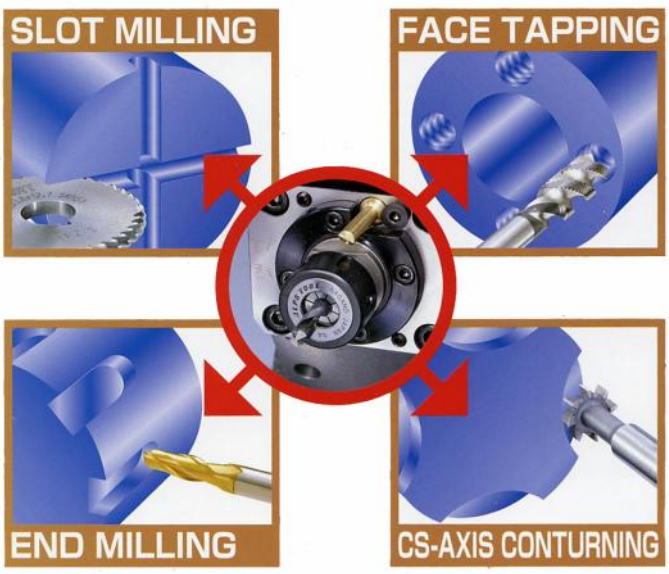


Y-AXIS SLIDE

Y-axis for 6-axis machining is now possible on the BNE Series with the addition of an Ys-axis slide for the upper turret to move on. Pure Y-axis motion is accomplished by simultaneously moving the upper turret along both Ys and X-axis. Movement along these axis are automatically calculated by the 30i-TA CNC control based on the Y-axis programmed coordinate. Similar to the other axis, a ball screw and servomotor through the use of the CNC programming control drive this new slide. Now, more complicated machining from the bar is possible to be able to finish the parts complete in one set up.

REVOLVING TOOL ATTACHMENT UPPER AND LOWER TURRETS (RTA)

The revolving tool attachment allows multiple machining operations to be performed by using live revolving tools attached to the upper and lower turrets. Each tool station on the turrets of the BNE-51SY5 is capable of utilizing a live tool for the possibility of 24 driven tools in the machine at any one point. 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 revolving tool attachment provides a wide selection of machining capability on the main and sub 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 for the upper turret and lower turret. 23.33 horsepower Fanuc servo drive motors are used to drive the BNE-51SY5 revolving tools. The servo driven revolving tool motors make rigid tapping possible with both upper and lower turrets.



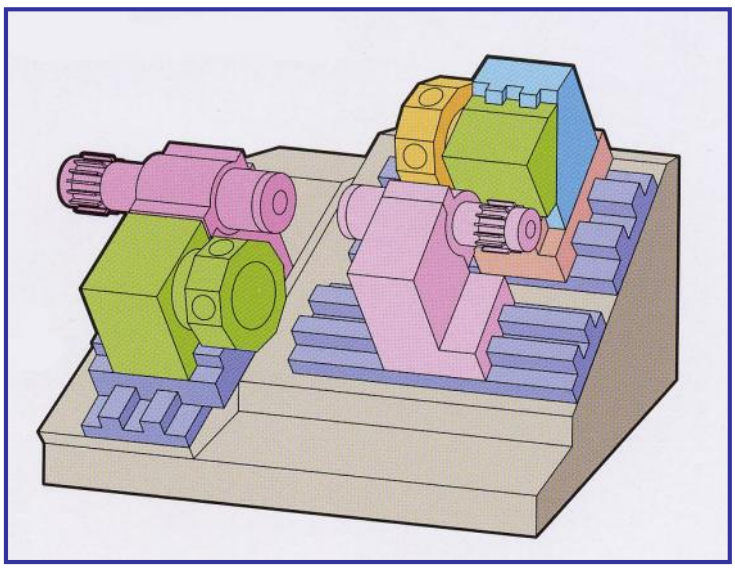
MAIN AND SUB SPINDLE C-AXIS CONTROL

The main and the sub spindle are equipped with a C-axis control for 8-axis machining. The C-axis combined with the sub spindle work transforms the machine into a MANUFACTURING CELL that produces complex parts in one set up. The spindle s 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 is standard w ith the C-axis to program complicated contours by giving a minimum point, almost eliminating the need for a CAD system and complex calculations.

SLANT BED DESIGN

The 45-degree slant bed design provides rigidity for heavy cutting and large swing for unobstructed machining. Tooling is easily accessible for fast set-up. Part loading and unloading is performed quickly and easily with less operator fatigue. All chips flow freely downward into the chip bed area without interfering with parts cutting.

The head stock construction and slant bed design are free from heat influence. The spindle headstock, turret slides, and spindle drives are mounted on the same 45-degree composing plain. This construction heat-symmetry against the spindle centerline, minimize s dimensional fluctuation caused by heat rise.



MAIN SPINDLE DRIVE

A 20 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 spe ed selection through direct RPM spindle programming. The AC spindle drive motor allows powerful cutting throughout the RPM range.

SUB SPINDLE AND CYLINDER TYPE WORK EJECTOR

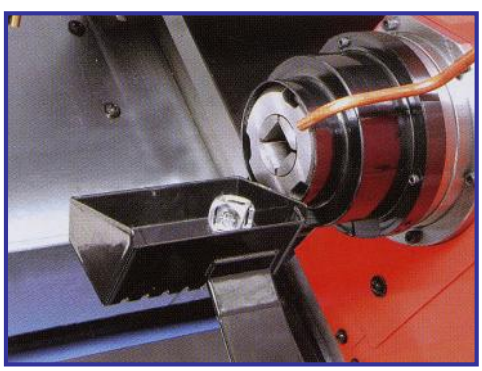
The sub spindle is powered by a 7.5 horsepower Fanuc AC spindle drive motor with an infinitely variable spindle speed range from 67 to 5000 RPM. Without the use of the work ejector, the max spindle speed raises to 7,000 RPM. The sub spindle is mounted on a heavy -duty hand scraped, hardened, and ground slide. An additional servo motor that allows precise positioning along the B-Axis positions the slide.

Upon completion of the first side of a part by the main spindle, the sub spindle synchronizes to the same RPM as the main spindle for pickup and then cutoff operation is performed. Th is operation can also be performed with constant surface speed command, allowing improved tool life. The sub spindle allows various secondary operations such as turning, boring, facing, and threading (single point and tapping) to be completed on the cutof f side of the part. After machining is completed, a CNC controlled pneumatic air cylinder type work ejector ejects the finished part out of the sub spindle into a parts catcher. Therefore, maintaining complete machining of the part in one set up. Consequ ently, first and second operation machining is completed at the same time, thereby reducing total part cycle time by as much as 50%.

This sub spindle configuration is excellent for parts that require first and second operation machining. It provides the c apability 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 uninterrupted bar work production. After machi ning the backside of the work piece on the sub spindle, the part is ejected into the parts catcher. The catcher then places the finished work piece onto the conveyor where it is transferred outside of the machine into a parts pan.



FLOOD COOLANT SYSTEM

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

HIGH PRESSURE COOLANT SYSTEM

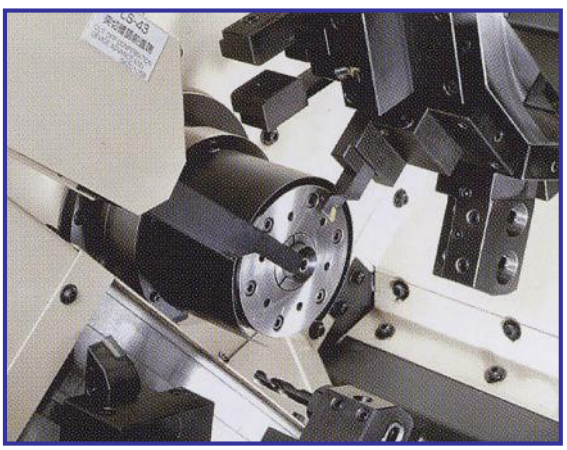
A 160-PSI high-pressure coolant is fed through the turret for the station in use to the tip of the cutting tool. The program controls the coolant start/stop. The high-pressure coolant system operates independently from the flood coolant system for maximum chip flushing. This high pressure is supplied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



MAIN AND SUB 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 main to sub spindle without any marking on the part. Round or hex material can be transferred without stopping both spindles therefore reducing machining time.

COLLET SYSTEM

The main spindle collet system accepts the H-S22 collet and the sub spindle collet system accepts the H-S16 collet . The main and sub spindle can also be equipped for other optional collet systems.

MIYANO FANUC 30i-TA CONTROL

Miyano simplifies 8-axis programming with the latest control technology by using separate programs for the upper and lower turret, and the simultaneous operation of these programs with M-codes. The BNE-51SY5 will have a 10.4" full color screen.

Miyano's work coordinate system setting function automatically sets the tool indexing position for both the upper and lower 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.

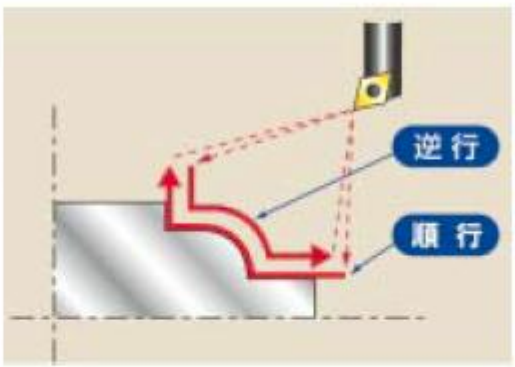
Standard control features include 8-axis programming, constant cutting speed control, decimal-point programming, corner chamfering and corner rounding, multiple repetitive cycles, canned cycles, manual pulse generator, tool nose radius compensation and RS232C (Serial) interface for remote data input and output.

UPDATED STANDARD FANUC OPTIONS

New standard options were added for the BNE-51SY5. The program memory was doubled to 160m per side. And the number off offsets was doubled from 32 to 64 pairs per turret. Also new is the Miyano Tool Life Management. This allows the operator to monitor individual tools to a specific servo or spindle load.

MANUAL HANDLE RETRACE

Manual handle retrace is provided by Miyano for the BNE-51SY5. This feature allows the setup person a means to easily prove out all three programs (for making one part) by manually moving the pulse generator clockwise to go forward or counterclockwise to go backw ards in the program. All axis movements and turret indexing will take place according to the programs as the pulse generator is rotated by the operator. This allows the setup person to check all tooling clearances as well as make sure all movements look good before running cycle full speed.



When moving reverse direction, function needs to change parameter.

STANDARD TOOL HOLDER PACKAGE

Qty.	Part No.	Description	Turret
(10)	1X78010A	Turning Holder A	Upper
(9)	1X78040A	Double Plain Head A	Upper
(2)	1X78420A	Double Plain Head B	Upper
(2)	1X78460A	Double & Turning Holder B	Upper
(1)	2X78240B	Cut-Off Tool Holder L	Upper
(2)	5W78500A	Round Hole Bushing (1/4”)	Used with Single Plain Head
(2)	5W78510A	Round Hole Bushing (3/8”)	Used with Single Plain Head
(2)	5W78520A	Round Hole Bushing (1/2”)	Used with Single Plain Head
(2)	5W78530A	Round Hole Bushing (5/8”)	Used with Single Plain Head
(2)	5W78540A	Round Hole Bushing (3/4”)	Used with Single Plain Head

Turning Holder A
(1X78010A)

Double Plain Head A
(1X78040A)

Double Plain Head B
(1X78420A)

Double & Turning Holder B
(1X78460A)

Cut-Off Tool Holder L
(2X78240B)

Round Hole Bushing
(10 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 tooling.

OPTIONAL REVOLVING TOOLS

Part No.	Description	Drill/Mill Collet / (Max Capacity)	Tapping Collet
2X785600	X-Drill/Mill	ER20 / (13mm)	ET1-20
2X785500	Z-Drill/Mill	ER20 / (13mm)	ET1-20

X-Drill/Mill
(2X785600)

Z-Drill/Mill
(2X785500)

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

CHUCK (OPTION)

The BNE series can be equipped with an optional 6” diameter high -speed 2 or 3-jaw hydraulic chuck for the main spindle. The sub spindle can be optionally equipped with a 4” diameter high-speed 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 co olant 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)

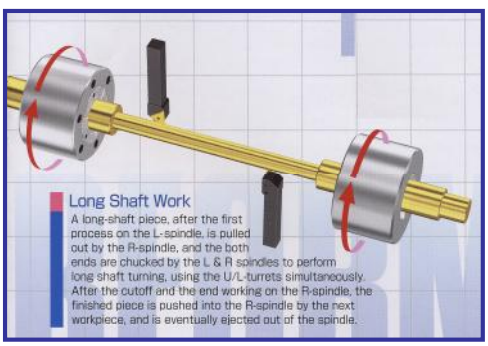
A chip conveyor is available to provide automatic chip disposal. When equipped with the ch ip conveyor, chips are channeled out of the machine into an optional chip cart to provide a clean machining environment.

HIGH SPEED BAR FEED SYSTEMS (OPTION)

A variety of hydrodynamic bar feed systems can be used with the BNE -51SY5. Refer to our recommended selection of bar feeders.

LONG SHAFT WORK (LSW) (OPTION)

The long shaft work option allows 30MM diameter parts up to 11 -3/4” long to be completely machined from bar stock in a continuous single operation. The shaft is swallowed through the sub spindle and transferred into a long shaft bucket to the outside of the sub spindle. Depending on the cutting condition, the machine is capable of machining a shaft for up to 2 feet in length (Will require modification of LSW tray).



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 BNE-51SY5 SPECIFICATIONS

BAR WORK

Round collet capacity ..... 2”

CHUCK WORK

Chuck size (main spindle) ..... 6”
(sub spindle) ..... 4”

WORK LENGTH

Maximum turning length ..... 3.54”

MACHINING CAPACITY

Maximum turning diameter (main spindle) ..... 6”
(sub spindle) ..... 3”
Maximum turning length ..... 3.54”
Swing diameter of turret
Upper ..... 20”
Lower ..... 17.9”

MAIN SPINDLE

Collet capacity ..... 2”
Spindle speed range (infinitely variable) ..... 67 to 5000 RPM
Variable speed steps ..... Direct drive
Spindle drive motor (30 minute rating) ..... AC 10 HP
Motor Type ..... AC type
Spindle nose A2-6

SUB SPINDLE

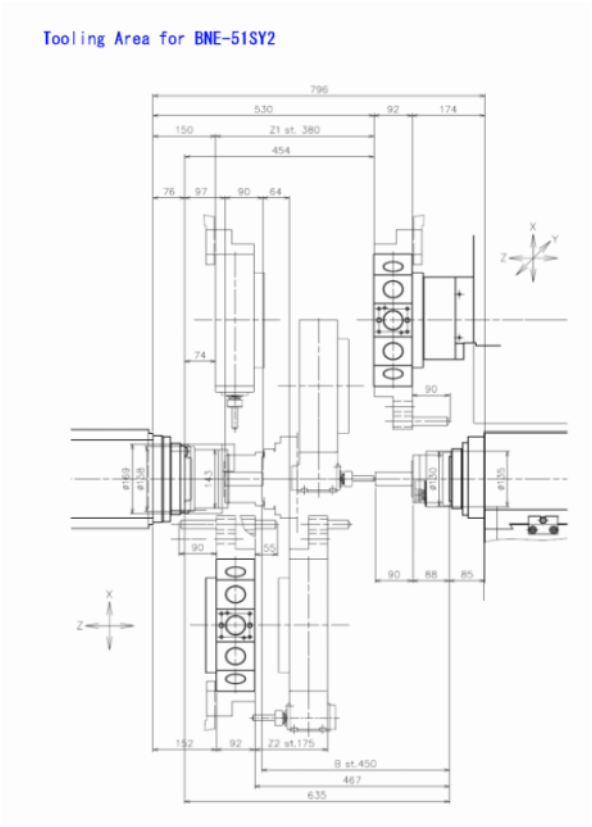
Collet capacity ..... 1-5/8”
Spindle speed range (infinitely variable) ..... 67 To 5000 RPM
Spindle drive motor (variable speed) maximum rating ..... AC 7.5 HP
Spindle nose ..... Flat
Slide movement (B-axis) ..... NC Control
Slide stroke (B-axis) ..... 17.7”
Rapid traverse rate (B-axis) ..... 472 IPM

UPPER TURRET

Number of tool stations 12
Slant bed .....45 Degrees
Maximum slide stroke (X-axis) .....6.8”
(Z-axis) .....15”
(Y-axis) ..... +/-1.57”
Rapid traverse rate (X-axis) .....472 IPM
(Z-axis) .....472 IPM
(Y-axis).....393 IPM
Turret indexing time ..... 0.25 Sec/pos
Turret indexing type .....Bi-directional

LOWER TURRET

Number of tool stations 12
Slant bed ..... 45 degrees
Maximum slide stroke (X-axis) .....5.7”
(Z-axis) .....6.8”
Rapid traverse rate (X-axis) .....393 IPM
(Z-axis) .....472 IPM
Turret indexing time ..... 0.25 Sec./pos.
Turret indexing type ..... Bi-directional



PARTS CATCHER

Maximum part diameter ..... 2”
Maximum part length ..... 3.54”

REVOLVING TOOL ATTACHMENT UPPER TURRETS

Number of positions (upper turret) 12
Drive motor maximum rating (upper turret) ..... AC 3.3 HP
Speed range (infinitely variable) ..... 0 to 4000 RPM
Revolving tool axis ..... X and Z

REVOLVING TOOL ATTACHMENT LOWER TURRETS

Number of positions (upper turret) 12
Drive motor maximum rating (upper turret) ..... AC 3.3 HP
Speed range (infinitely variable) ..... 0 to 4000 RPM
Revolving tool axis ..... X and Z

C-AXIS SPINDLE CONTROL (MAIN & SUB)

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

CHUCK (OPTION)

Chuck diameter (main spindle) ..... 6”
(sub spindle) ..... 4”
Type ..... Hydraulic
Model ..... Howa & Kitagawa
Maximum speed ..... 5000 RPM
Concentricity total indicator reading..... 0.0005”

GENERAL SPECIFICATIONS

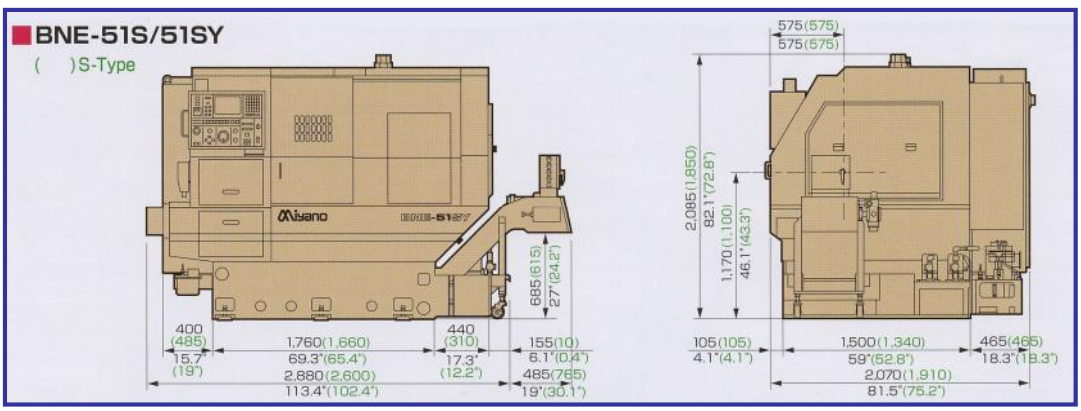
Power required ..... 40 KVA
Voltage required ..... 220 Volts +10% -15%
Amperage required ..... 100 Amp
Compressed air required ..... 80 PSI

TURRET TOOLING

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

MACHINE DIMENSIONS

Width ..... 82”
Height ..... 82”
Length ..... 113”
Machine weight ..... 15,650 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 ot her causes beyond our control.

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

Sincerely,

Miyano Machinery, Inc.