CITIZEN

Miyano

BNE51

Fixed Headstock Type CNC Automatic Lathe

The BNE series handles your high value barwork.

The BNE Series was designed to handle today's ever demanding high efficiency barwork. Operating multiple tools simultaneously, parts with more complex functions can now be produced with higher level of efficiency. The S-Type features simultaneous multiple tooling on the L-/R-spindles.

The „SY" type with Y-Axis slide for the upper turret has the capability of a machining center to handle more complex workpieces.

The new design of the 2-types feature easies programming and machine operation to reduce set-up times.


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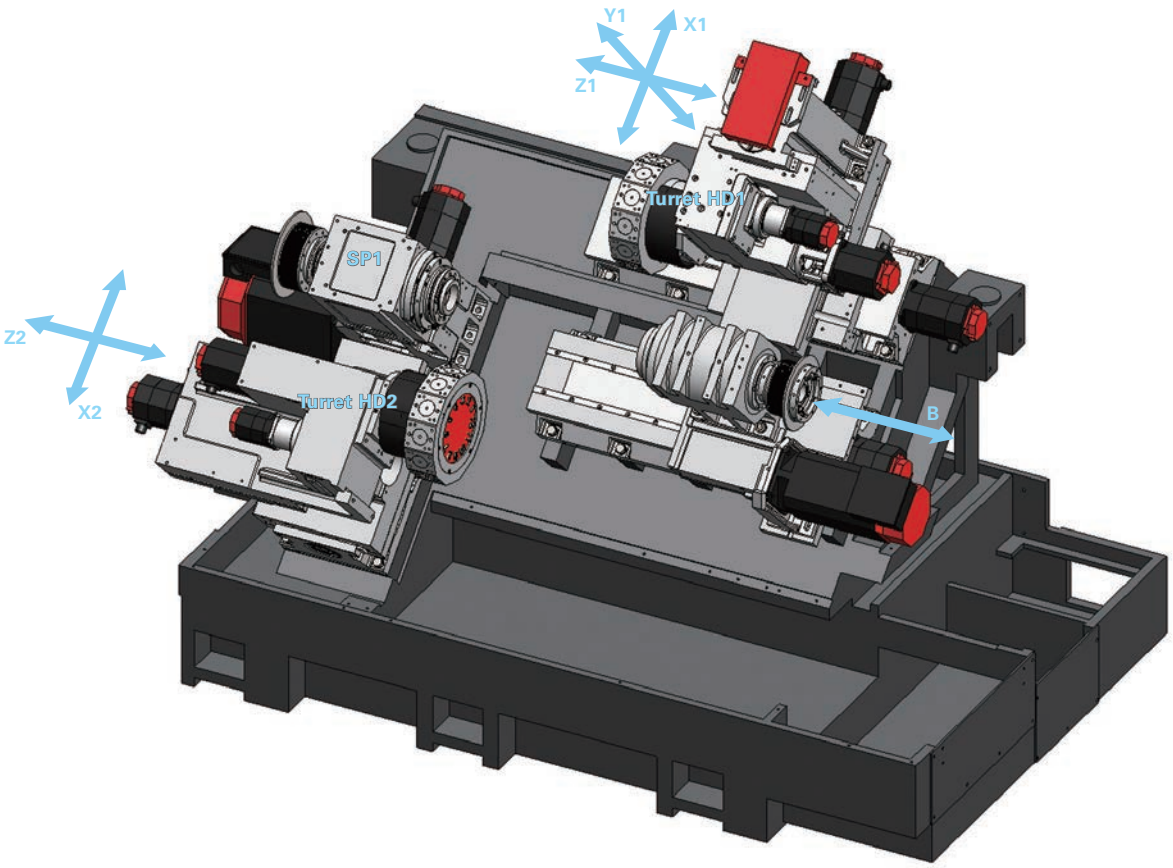
BNE51

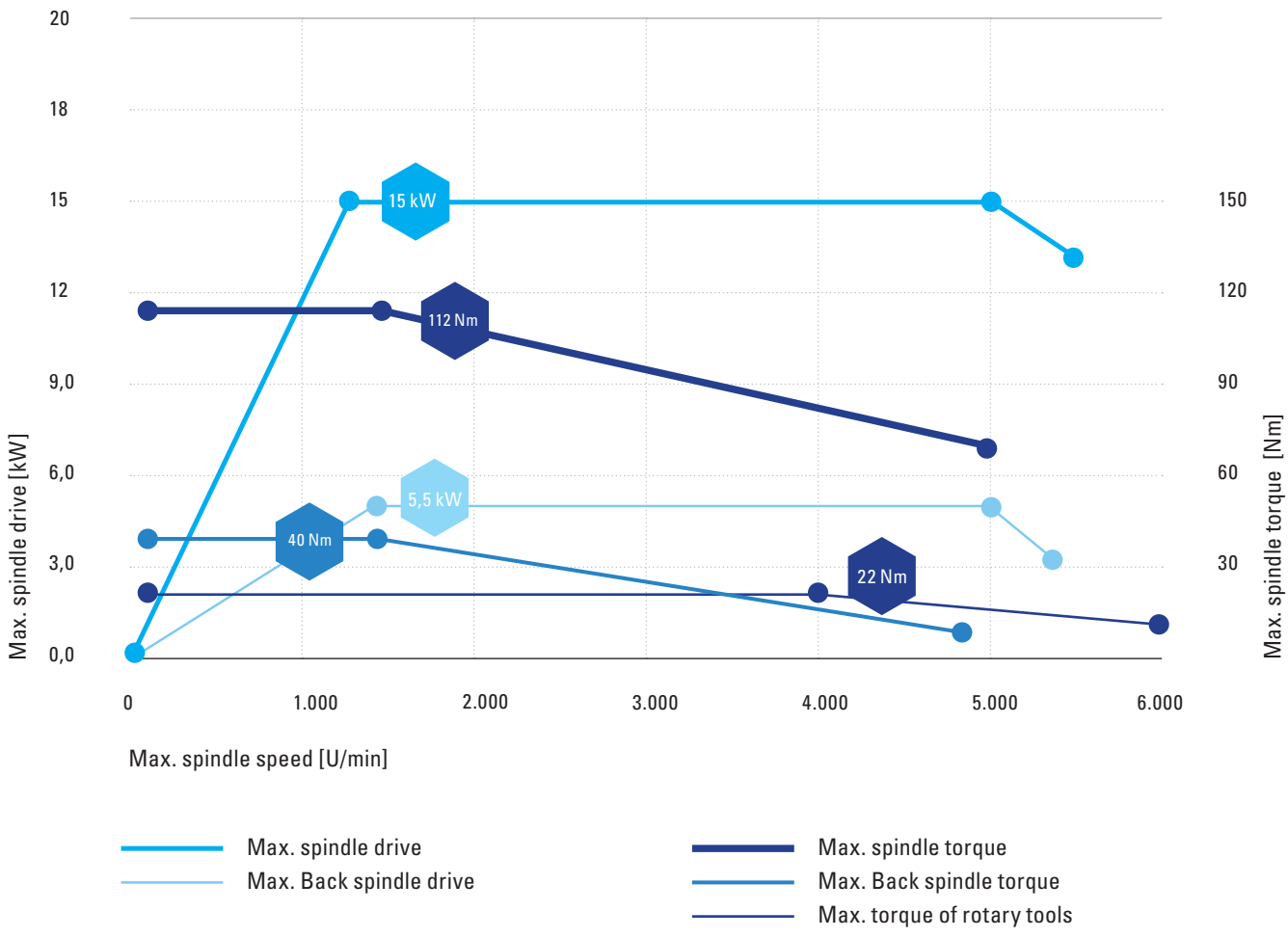
Rigid Construction.

The basic construction of the machine, that is the combination of the highly rigid precision scraped square guideways and the heavy slanted bed cast in one piece, is the base to support high precision, heavy cutting and long tool life even in complex machining.

BNE51



Power and torque graph of the Miyano BNE51



Two models available.

SY

Y Axis on Turret HD1

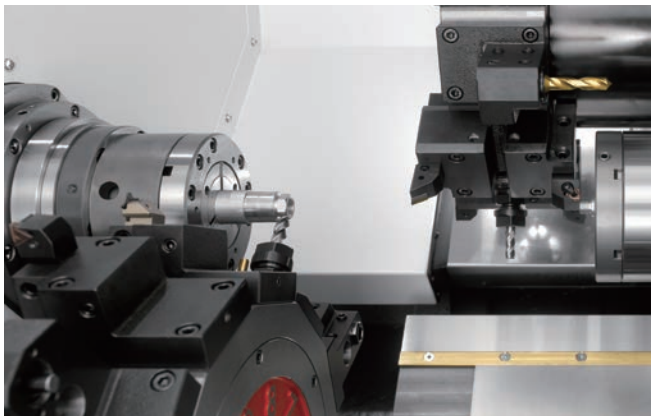
In addition to front / back integrated machining and multiple cutting achievable by the 2-spindle and 2-turret specification machines, the Y axis installed on turret HD1 (SY type) enables a greater variety of complex machining.

Ample Tool Stations

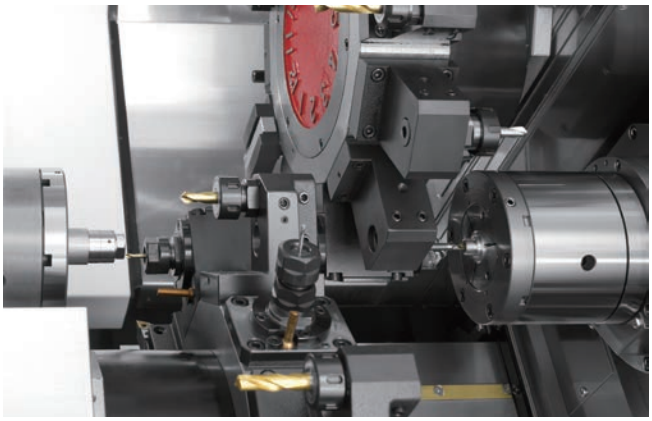
Installation of double tool holders on the 12-station turret allows two tools to be mounted at a single position, so you will never feel short of tools. (Common to S/SY types)

Powerful Tool

Revolving tools featuring a power ful machining torque of 20 Nm and high rotational speeds of up to 6.000 min^{-1} can be mounted at all positions (12 positions) with independent drive. (Common to S/SY types)



S



Two Spindle Capacities

BNE51 51mm
and two versions S without Y axis and SY with Y axis to turret HD 1.

Revamped NC Unit

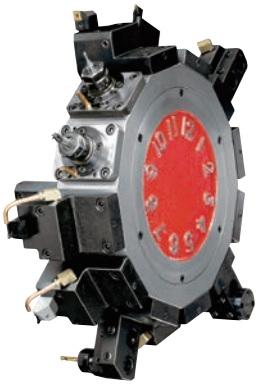
The new 31i-B NC unit simplifies the operation panel with less push buttons and support screens including “Machining Data”, “Start Conditions” and “Tool Monitor” (option) enable further improvements in productivity by faster set-ups. (Common to S/SY types)

Newly Designed Covers

All the covers have been reviewed in detail and redesigned to improve ease of operation, including changing the splash guard to open inside the fixed cover. (Common to S/SY types)

Rigid design for highest accuracy.

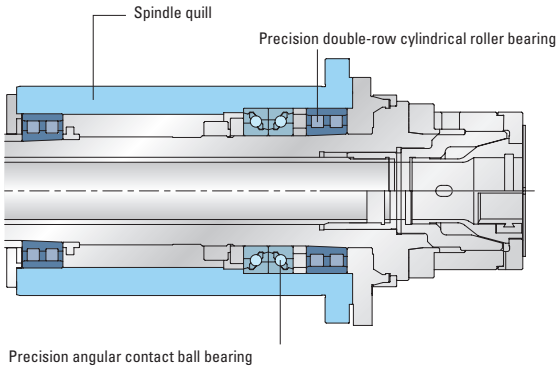
Turret



Indexing by a large-diameter curvic coupling, secure hydraulic turret clamping and rugged square guideways assure high precision and long life of the turret without compromise. This turret can accommodate revolving tools with a high machining torque of 20 Nm at all 12 positions. Our unique tool holder mounting method using two location pins makes it easy to mount and remove tool holders and ensures exceptionally high re-mounting accuracy.

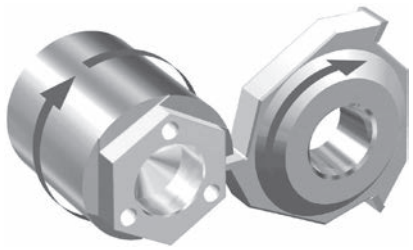
Spindle

Sectional view of type 51 spindle



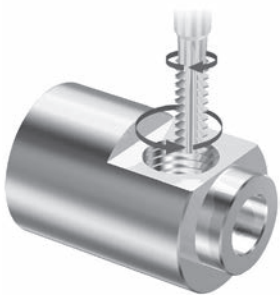
The main spindle of the 51S / 51SY is supported by “ultra precision double-row cylindrical roller bearings” and “ultra precision angular contact ball bearings” at the front and by “ultra precision double-row cylindrical roller bearings” at the rear to suppress radial run-out and thermal displacement in the longitudinal direction as well as to provide high rigidity. This precision spindle is installed in a ground, high-precision quill type housing. This spindle structure maintains sufficient rigidity to allow powerful machining and ensures stable thermal displacement characteristics thanks to less heat generation. All spindles are manufactured in the dedicated in-house production line and undergo extended bench testing before being assembled into the machine to provide the stable machining accuracy for which Miyano is renowned.

Machining Examples



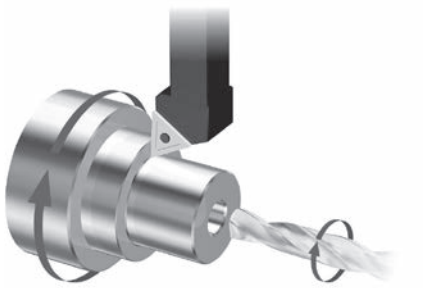
Polygon machining (Optional)

Synchronizing the revolving tool speed with the spindle speed at two times permits polygon machining, such as two-, four- and six-sided machining, with a polygon cutter.



Large-diameter thread cutting using helical interpolation (Optional)

Large-diameter thread cutting can be done with a planetary tap using the helical interpolation function. (SY type)



Differential velocity cutting by revolving tools

In multiple cutting of inner and outer diameters, the optimum cutting speed can be obtained by controlling the revolving tool speed. A smalldiameter drill is rotated in the forward direction to increase the relative speed between the drill and the workpiece, while a large-diameter drill is rotated in the reverse direction to decrease the relative speed.

Long-shaft machining

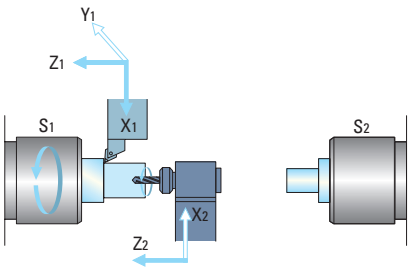
The bar stock machined on the L spindle is pulled out by the R spindle and chucked in synchronization by the L and R spindles at the same time. Simultaneous machining / simultaneous complex machining is performed and then the workpiece is cut off. After that the machining at the R spindle side is performed and the finished product is pushed out of the R spindle by the next workpiece.

Efficient face drilling

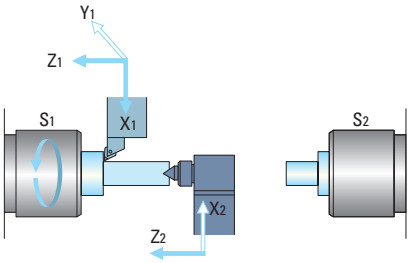
In complex machining in the X-Y or Z-Y plane, using C axis control to index the drilling position takes a long time. Using the Y axis allows efficient drilling on the end face. (SY type)

Machining Patterns

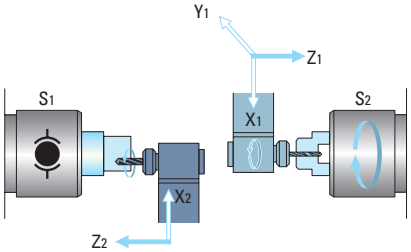
Differential cut



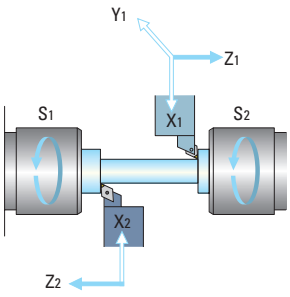
Center suport



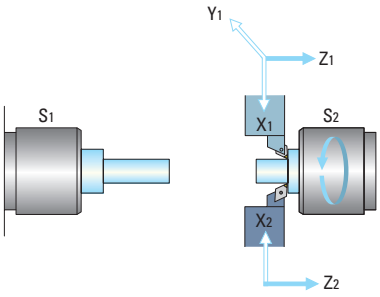
Drilling & tapping



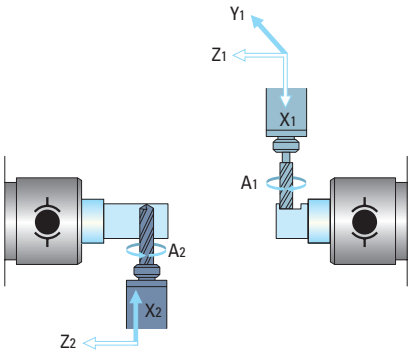
Long-shaft machining



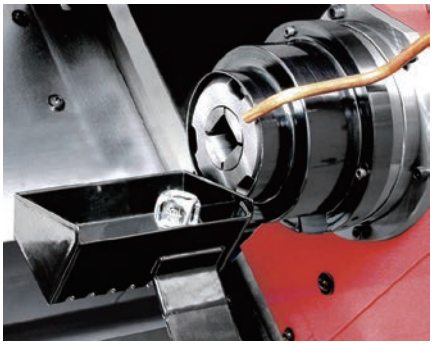
Balanced turning



Simultaneous machining

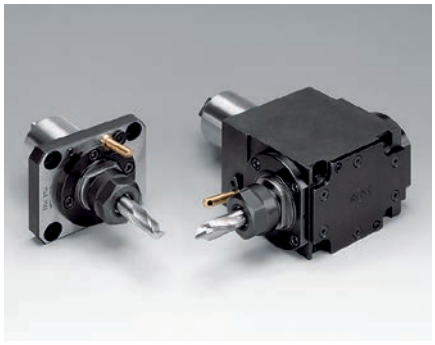


Accessories and Options



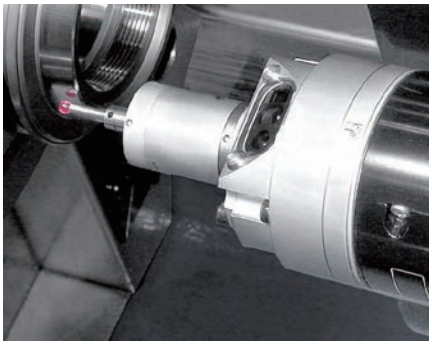
Part catcher

Catches finished workpieces without damaging them and transfers them to the part conveyor.



Revolving tool

Ensures high-power, stable milling at a torque of 20 Nm.



Automatic measuring device
Measures workpieces in the machine wirelessly using optical signal transmission.

Bar feeder

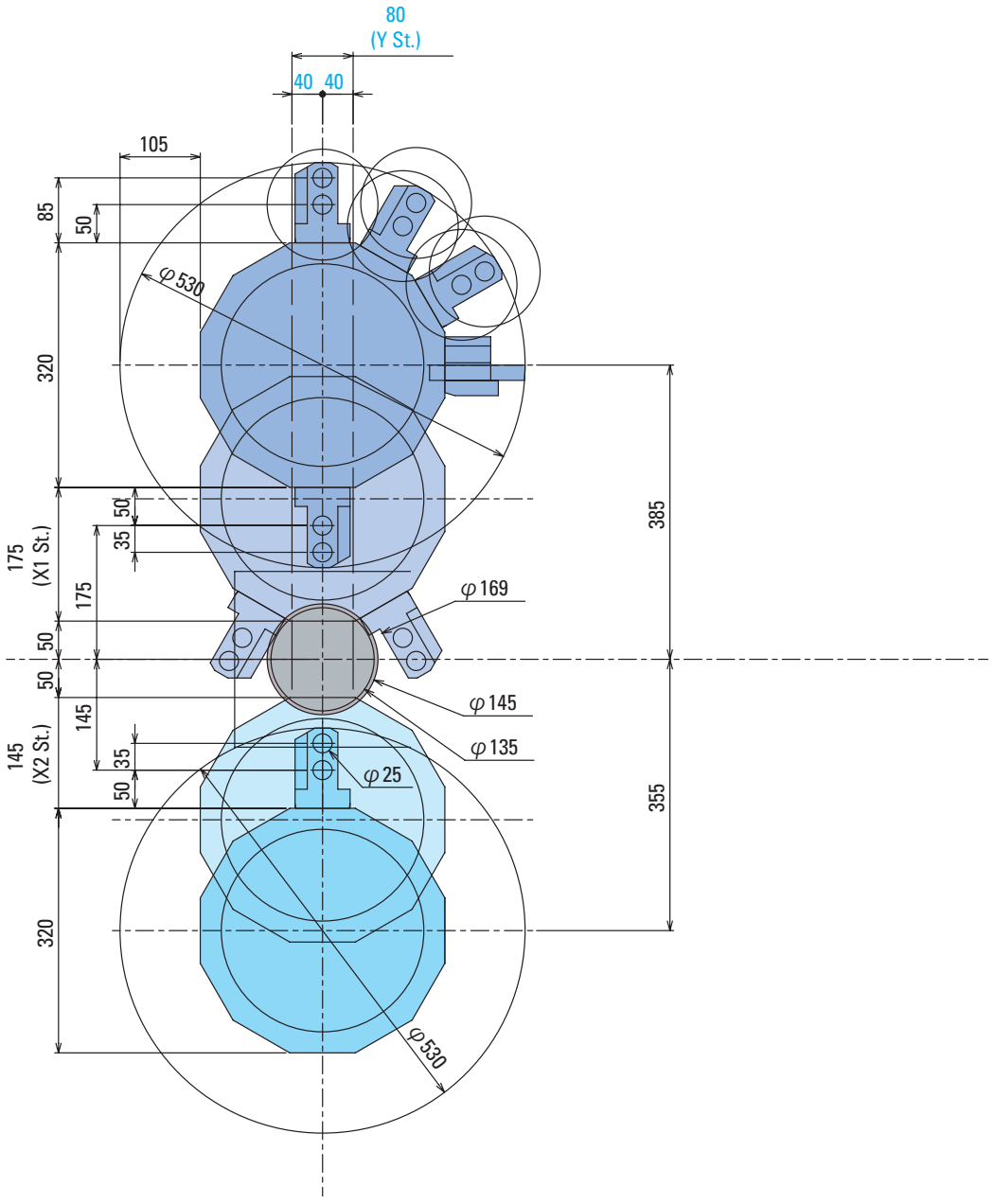
A range of barfeeders is available for short or long bars.

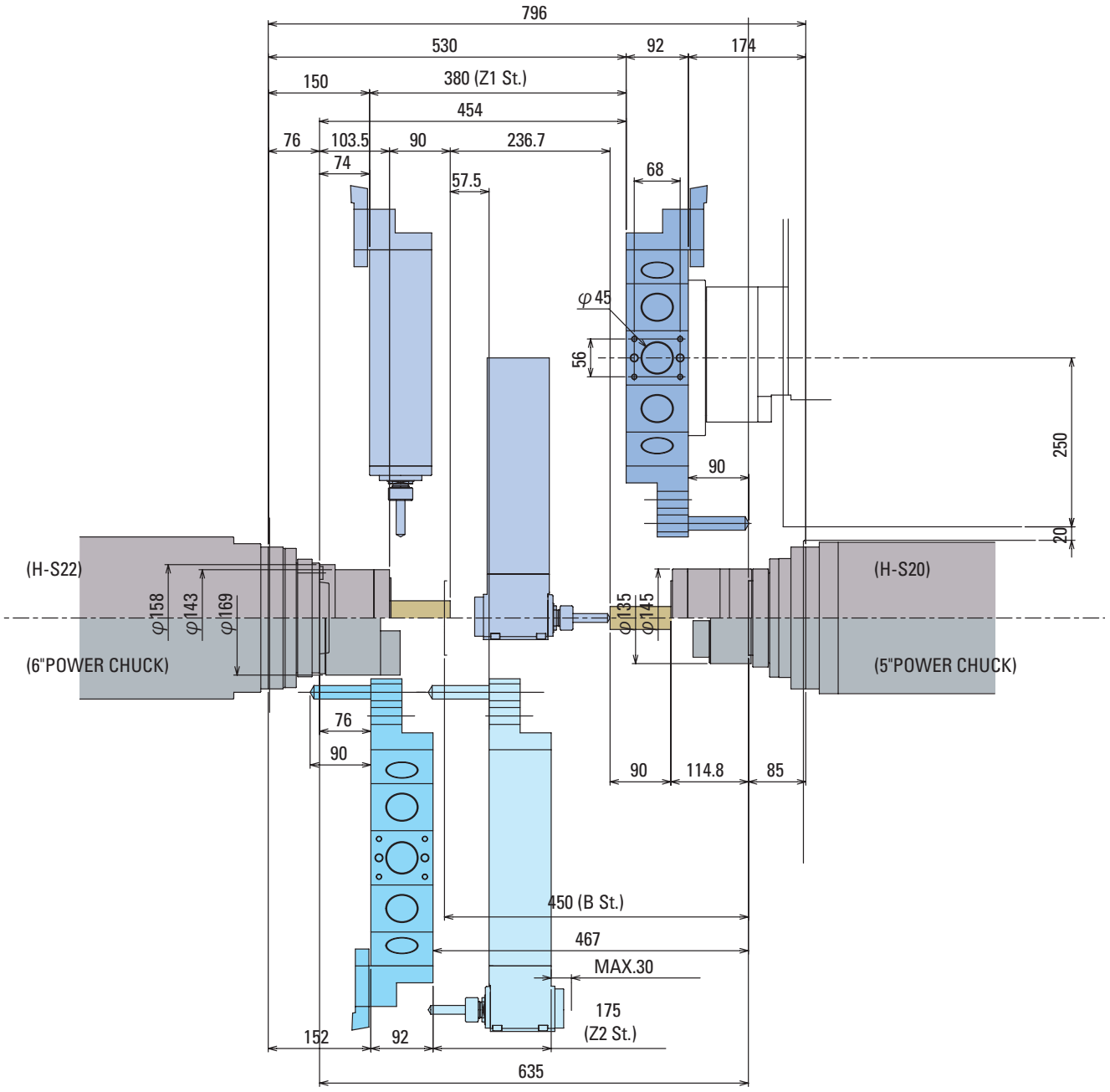
Chip conveyor

Ejects chips smoothly. Various types are available to suit the application.

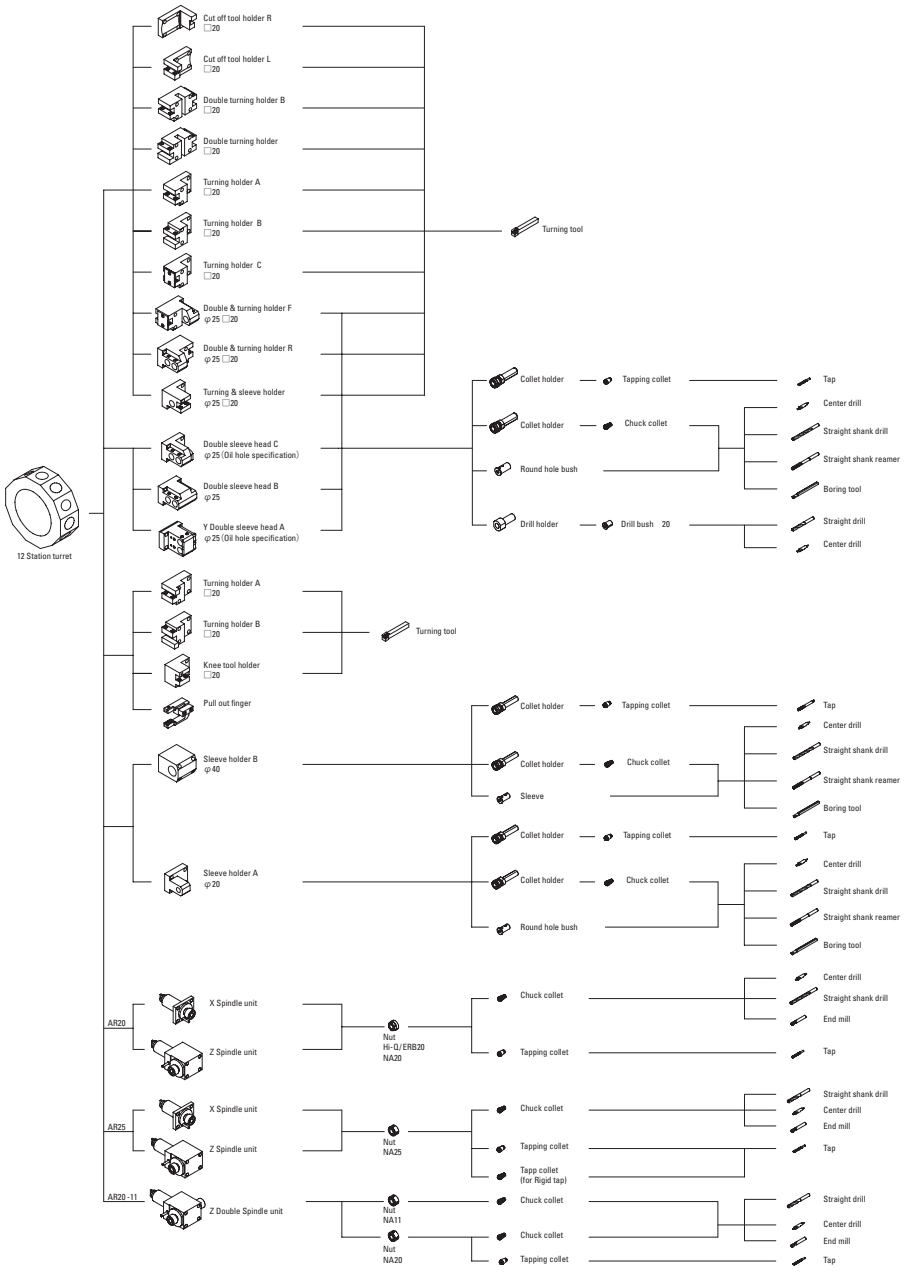
Tooling Area.

BNE51SY6

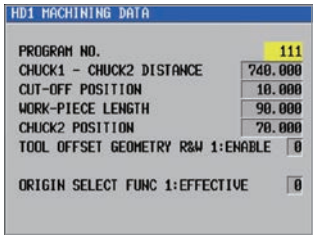



796
530
92
174
150
380 (Z1 St.)
454
76
103.5
90
236.7
74
57.5
68
φ45
56
250
90
20
(H-S22)
φ158
φ143
φ169
(6"POWER CHUCK)
φ135
φ145
(H-S20)
(5"POWER CHUCK)
76
90
90
114.8
85
450 (B St.)
467
MAX.30
175
(Z2 St.)
152
92
635

Tooling System.

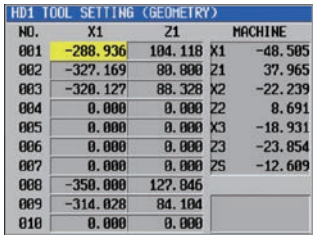


Support Screens.



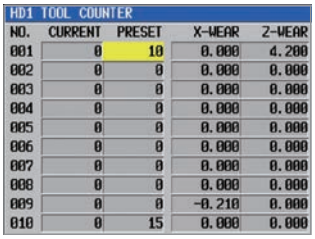
Machining data

Entering the machining length and position of the cut-off here makes it easier to measure geometry offsets and to mount tools.



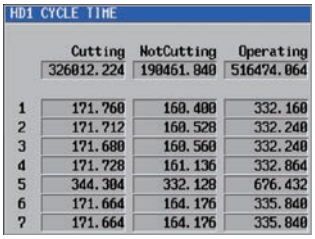
Tool setting

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 counter

Informs you of the timing (count-up) for tool changes in accordance with the set tool counter stop value.You can also enter wear offsets.

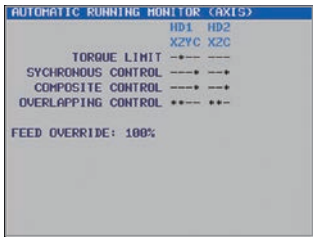


Cycle time

Allows you to measure the cutting time, non-cutting time and running time in each cycle.

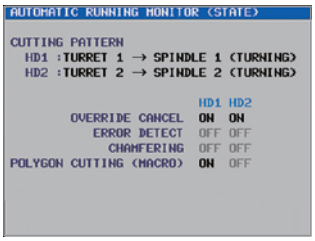
Automatic running monitor (Spindle / revolving tools)

Allows you to check the status of the spindle during automatic running.



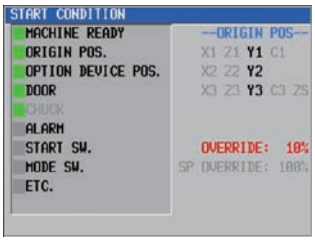
Automatic running monitor (axis)

Allows you to check the status of feed axes during automatic running.



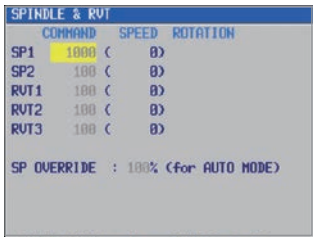
Automatic running monitor (status)

Allows you to check the machining conditions during automatic running.



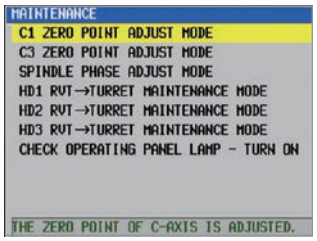
Start condition

Displays information on the start conditions for automatic running.



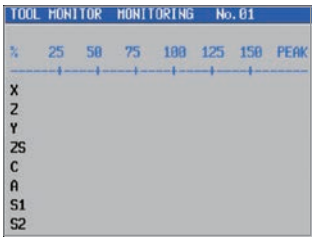
Spindle and revolving tool unit

Allows you to set the rotational speed (in manual operation) of the spindle and revolving tools, and to set the spindle override.



Maintenance

Used to turn the settings for maintenance ON and OFF.

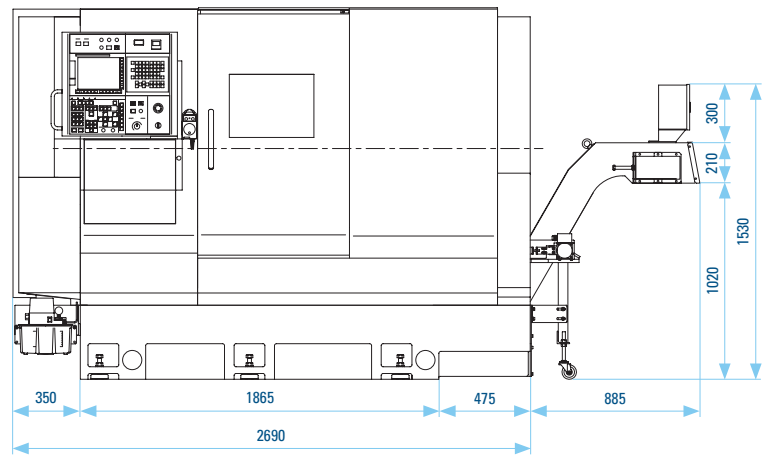


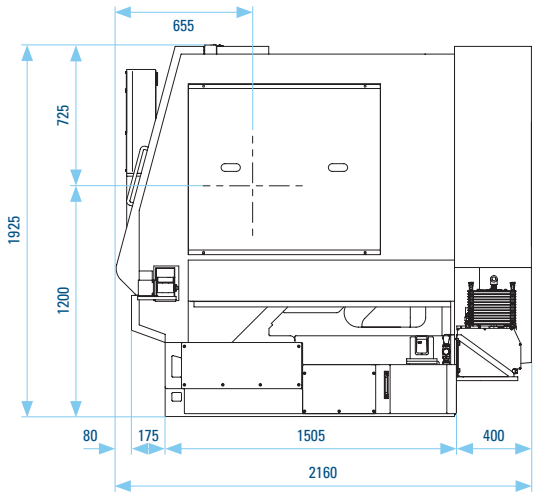
Tool monitor (option device)

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.

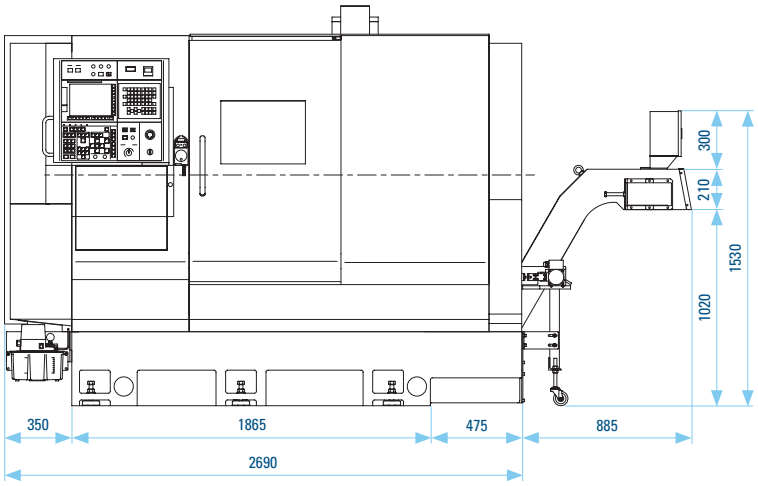
External View.

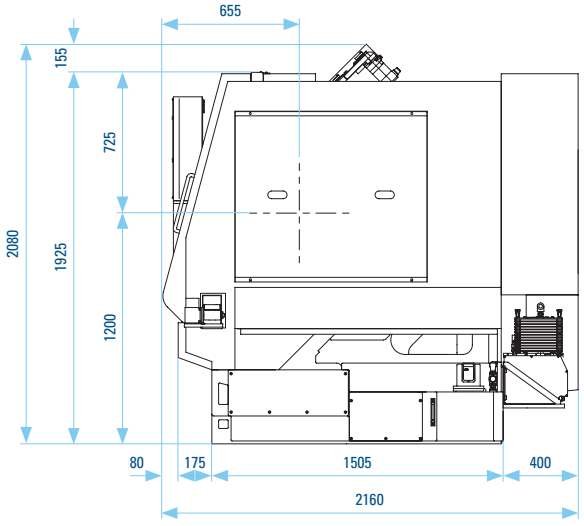
S





SY


300
210
1530
1020
350
1865
475
885
2690


655
155
725
2080
1925
1200
80
175
1505
400
2160

Tradition and Global Innovation Power for Local Markets.

Citizen Holdings Co., LTD. is a Japanese manufacturer operating in micro-technology and also being the world market leader in this sector. Citizen Group is divided into the five business sectors Watches, Electronic components, Electronic products, Other products and Lathes. The Group employs approx. 18,000 employees worldwide.
The holding company is headquartered in Tokyo, Japan. The company is listed on the Tokyo stock exchange.
Citizen Machinery Europe stands for innovation on the highest international level, hand in hand with traditional German engineering. German customers profit from the strength of an international large-scale enterprise.
At the same time, they may fall back on the more than 100-year old history in our local markets.

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- **Competent process support and optimization**
- **Always in your vicinity due to a close-knit service and distribution network**
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Machine specifications

Items		BNE51S6	BNE51SY6
Machining capacity			
Maximum work length			
Maximum bar diameter	SP1	Ø 51 mm	Ø 51 mm
	SP2	Ø 42 mm	Ø 42 mm
Spindle			
Number of spindles		2	2
Spindle speed	SP1	5.000 min^{-1}	5.000 min^{-1}
	SP2	5.000 min^{-1}	5.000 min^{-1}
Spindle nose	SP1	A2-6	A2-6
	SP2	Flat	Flat
Draw tube Dia.	SP1	Ø 52 mm	Ø 52 mm
	SP2	Ø 43 mm	Ø 43 mm
Type of collet chuck	SP1	H-S22/ DIN177E	H-S22/ DIN177E
	SP2	H-S20/ DIN173E	H-S20/ DIN173E
Power chuck size and type	SP1	6" (169 mm Dia.)	6" (169 mm Dia.)
	SP2	5" (135 mm Dia.) Hydraulic	5" (135 mm Dia.) Hydraulic
Turret			
Number of turret		2	2
Turret stations	HD1	12 ST.	12 ST.
	HD2	12 ST.	12 ST.
Shank size of square turning tool		20 mm Sq.	20 mm Sq.
Diameter of drill shank		Ø 25 mm	Ø 25 mm
Revolving tool			
Number of revolving tools		Max.12+12	Max.12+12
Type of revolving tools		Single clutch	Single clutch
Tool spindle speed range		Max. 6.000 min^{-1}	Max. 6.000 min^{-1}
Feed rate			
Rapid feed rate	X1 axis	18 m/min	18 m/min
	X2 axis	16.2 m/min	16.2 m/min
	Z1 axis	20 m/min	20 m/min
	Z2 axis	18 m/min	18 m/min
	Y1 axis		12 m/min
	B axis	20 m/min	20 m/min
Slide stroke	X1 axis	175 mm	175 mm
	X2 axis	145 mm	145 mm
	Z1 axis	380 mm	380 mm
	Z2 axis	175 mm	175 mm
	Y1 axis		± 40 mm
	B axis	450 mm	450 mm
Motors			
Spindle motor	SP1	15/11 kW (15min. /cont)	15/11 kW (15min. /cont)
	SP2	5.5/3.7 kW (15min./cont)	5.5/3.7 kW (15min./cont)
Revolving tool motor		2.2 kW 20 Nm	2.2 kW 20 Nm
Hydraulic operating motor		1.5 kW	1.5 kW
Lubricating motor		0.023 kW	0.023 kW
Coolant motor		0.25 kW	0.25 kW
High-pressure coolant motor		0.8/1.36 kW (50/60Hz)	0.8/1.36 kW (50/60Hz)
Turret index motor		0.75 kW	0.75 kW
Power supply			
Capacity		44 KVA	44 KVA
Voltage		AC 200/220 V	AC 200/220 V
Air supply		0.5 Mpa	0.5 Mpa
Fuse		125 A	125 A
Tank capacity			
Hydraulic oil tank capacity		10 L	10 L
Lubricating oil tank capacity		4 L	4 L
Coolant tank capacity		350 L	350 L
Machine dimensions			
Machine height		1.925 mm	2.080 mm
Floor space		W 2.725 x D 2.159 mm	W 2.725 x D 2.159 mm
Machine weight		7.800 kg	7.800 kg

NC Specification	
Model of NC	FS31i-B 2 system
Axial control	HD1: X1, Z1, (Y1), C1, A1
	HD2: X2, Z2, C2, A2, B2
Minimum setting unit	0.001mm, 0.001deg.
Interpolation functions	G01, G02, G03
Thread cutting	G32, G33, G92
Rapid feed override	0-100%
Feed rate override	0-150%
Feed rate perminute/Feed rate	G98/G99
Program storage capacity	The sum total of 2 system:64Kbyte (160m)
Spindle function	S4 digit
Support function	M3digit
Constant surface speed control	G96
Tool function	Taabb (aa=Tool number and geometry, bb=Wear offset number)
Tool compensation number	32 pieces, 64 pieces(2 system)

Automatic operation

Automatic operation, MDI operation, Program number search, Sequence number search, Dry run, Single block, Optional stop (M01), Jog feed, Manual reference point return, Set up/ display function, Machine alarm message display, Selfdiagnostic function, Periodical maintenance screen, Maintenance information screen, Help function, Actual speed display, Actual spindle speed and the T code display, Each group directory display.punch, Servo adjustment screen, Spindle adjustment screen, Hard & soft system configuration display.

Data input-and-output function

Memory card interface, USB memory interface.

Others

10.4" color LCD, Machine lock, Over tarvel, Stored stroke check, Chamfering ON/OFF, Backlash compensation, Synchronization / mixture control, Cs outline control, Spindle synchronous control, Superposition control, Polar coordinate interpolation, Optional block skip, Absolute command, Incremental command, A decimal point input, Coordinate system setup, Single form fixed cycle, The circle radius R command, Programmable data input.

Option

Cylindirical interpolation, Spindle rigid tap, Revolving tool rigid tap, Herical interpolation, Polygon turning, Work coordinate system, Inch / metric change, Tool nose radius compensetion, Custom macro, Multiple repetitive cycles, Program storage capacity addition, Background editing, Tool nose radius compensetion, Run hour and the number of parts display, Leader puncher interface, RS-232C port.

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