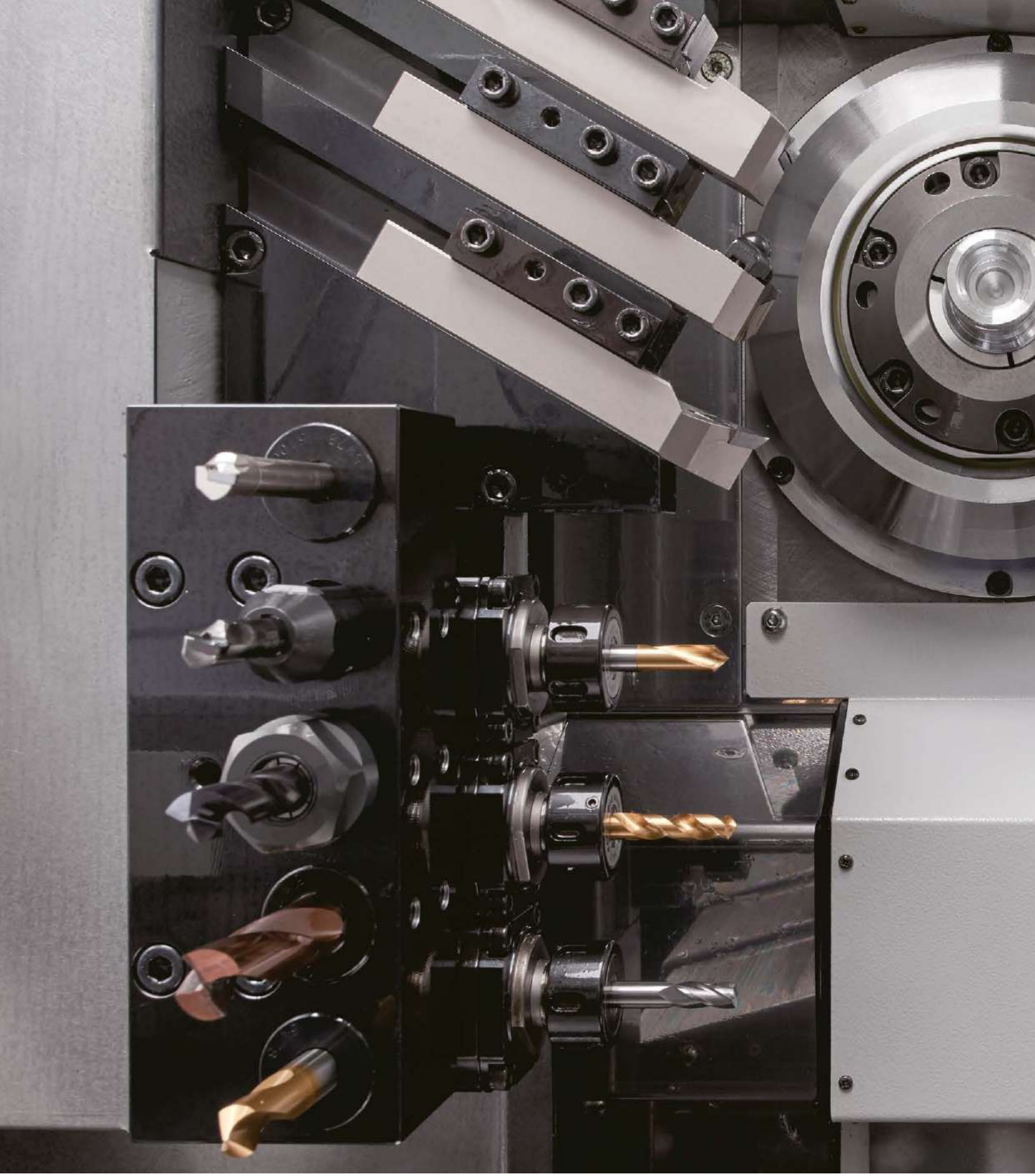
CITIZEN

Miyano

LFV technology

BNA42 GTY

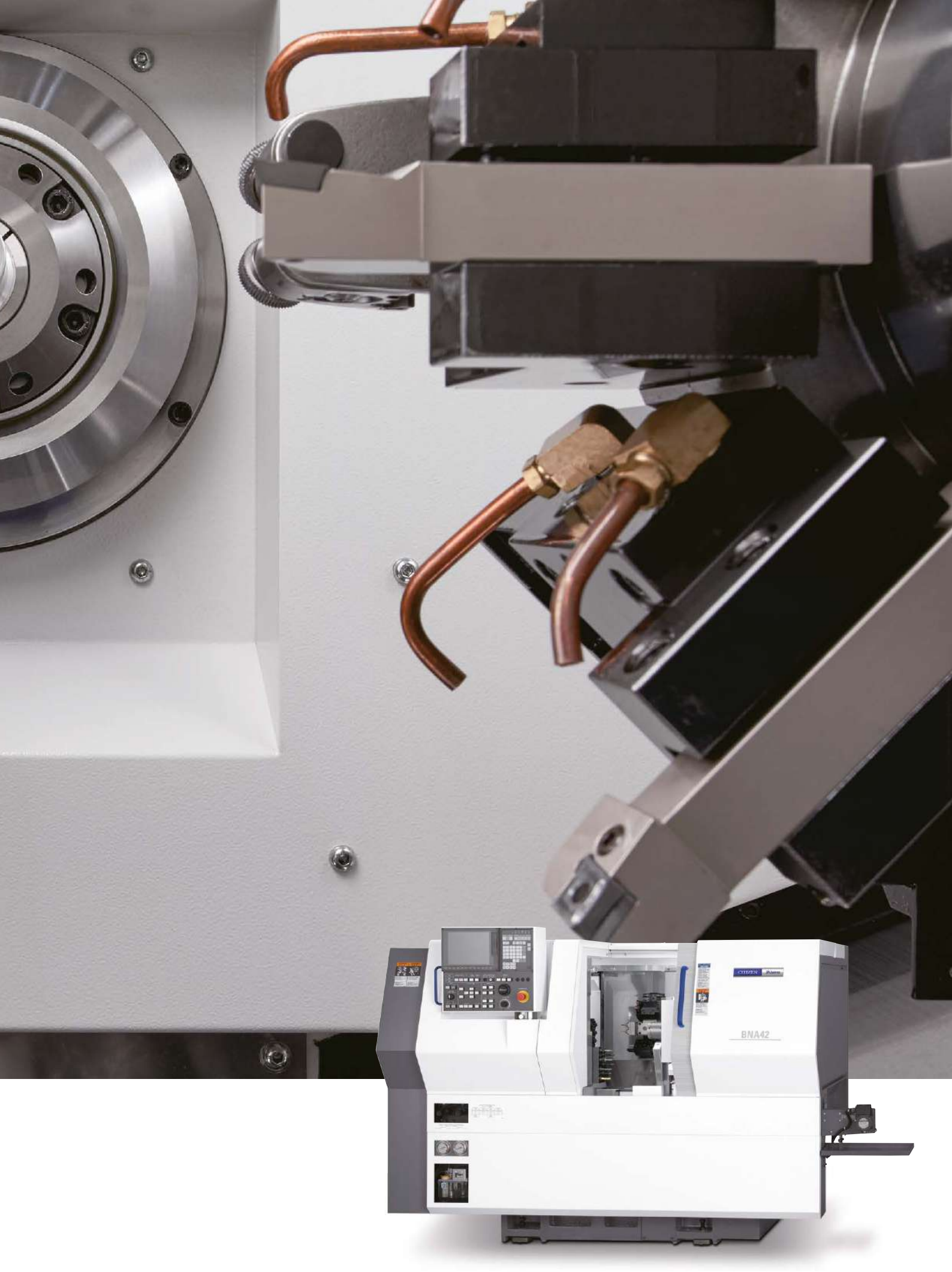
Fixed Headstock Type CNC Automatic Lathe



BNA-42GTY

Configured with two spindles, one turret, 2 x Y axis, gang tools and X3 axis to back spindle, the BNA-42GTY can mount up to 45 tools.

- 3 tool simultaneous cutting
- renowned Miyano accuracy
- high productivity with fast cycle times
- versatile tool layout

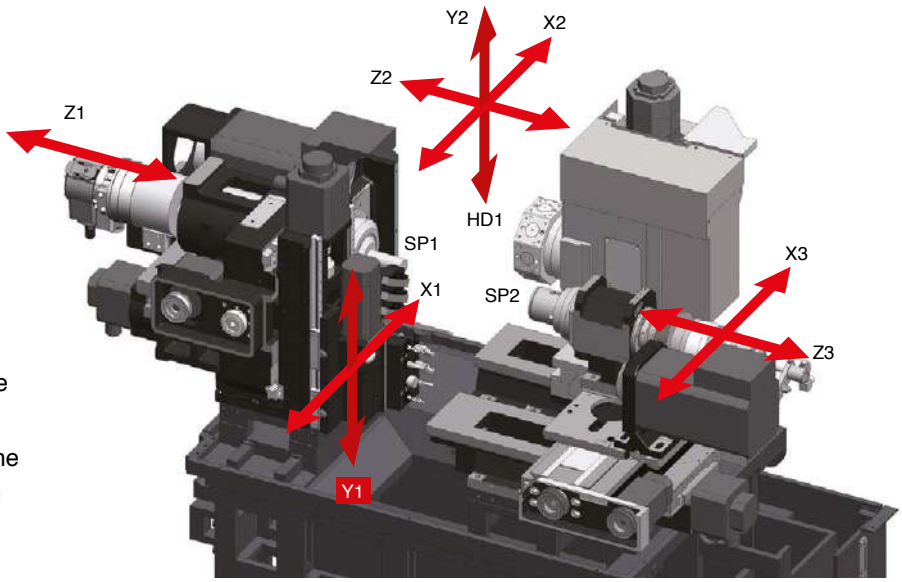

BNA42

Designed for accuracy and long tool life

High-rigidity hand scraped slideways are used on all axes.

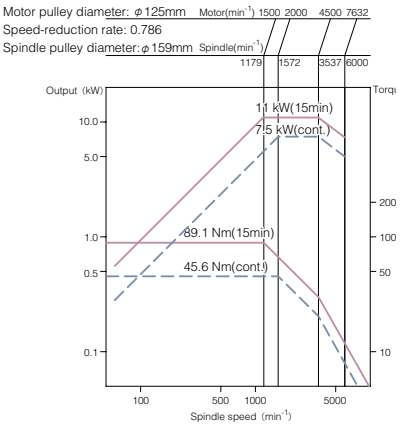
These slideways with face contacts have exceptional rigidity and damping characteristics, enable powerful cutting and help to prolong cutting tool life. The bed where major machine units such as spindles and tool slides are mounted has a platform-like surface table structure.

The unit mounting faces are not distorted by the effects of heat and even if the units are subject to thermal expansion they are all displaced in the same direction (perpendicular to their mounting faces). This minimises relative deviations between the workpiece and cutting tools.



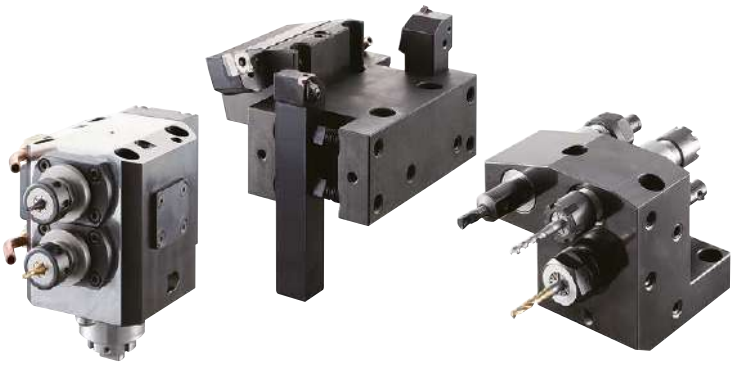
Spindle motors with increased output

The spindle 1 motor has the highest output in the BNA series. This enables powerful cutting.



Easy to use tooling system

The turret has 8 stations, but the half-indexing mechanism makes it possible to mount tools at up to 16 positions. The use of optional multiple tool holders can further increase the number of tool positions.

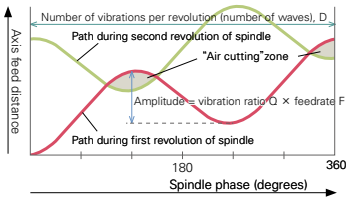
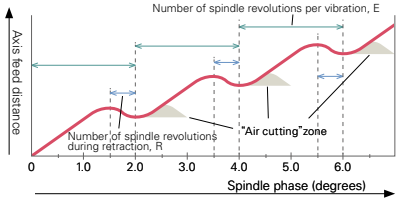


LFV Function (Optional)

LFV technology

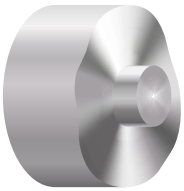
LFV (low-frequency vibration cutting) is a technology for performing machining while vibrating the X and Z servo axes in the cutting direction in synchrony with the rotation of the spindle. It reduces various problems caused by chips entangling with the product or tool and is effective for small-diameter deep hole machining and the machining of difficult-to-cut materials.

Vibration mode

Item	LFV mode 1	LFV mode 2
Operation	Multiple vibrations per spindle revolution	Multiple spindle revolutions per vibration
Specification	The axes execute multiple vibrations during one spindle revolution, reliably breaking chips up into small pieces.	Machining is carried out while rotating the spindle multiple revolutions per vibration
Application	Ideal for outer/inner diameter machining and groove machining	Ideal for micro-drilling, where peripheral speed is required
Waveform		

Note 1. LFV machining can be performed simultaneously on Z1 and X1 axes.
Note 2. For LFV machining with rotary tools, the “LFV function” and “rotary tool feed per revolution” options are required.

Representation of the cutting



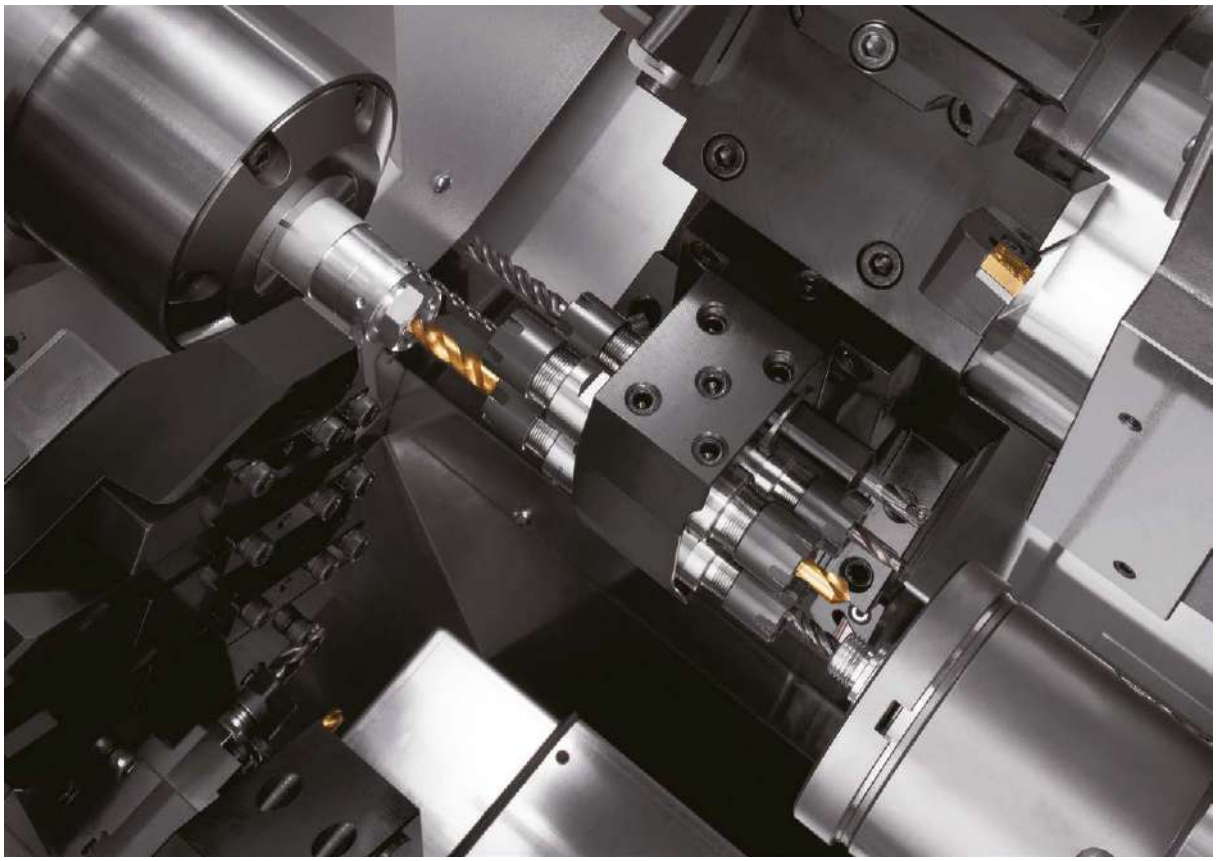
Comparison of chips
Material: SUS304 Weight: 14.3 g (same scale)

Chips generated by customary cutting

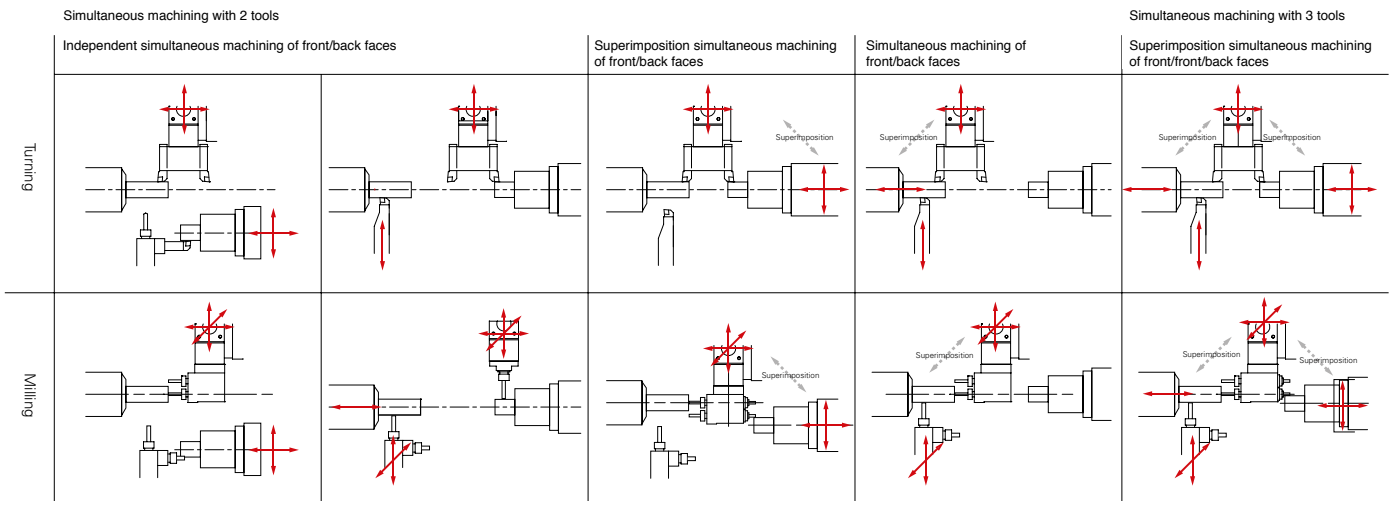
Chips generated by cutting using LFV

Cycle time shortened by superimposition control

Superimposition control allows simultaneous cutting with two tools at the main spindle (SP1), or with three tools when the sub spindle (SP2) is included, shortening cycle times.

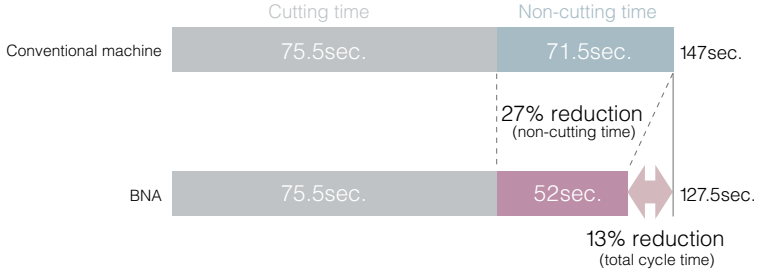


Examples



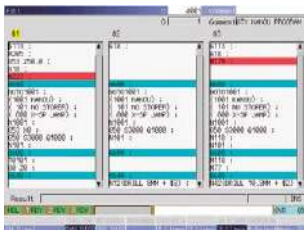
Substantial reduction in non-cutting time

The unique control system cuts non-cutting time by 27% (compared to earlier equivalent Miyano products).
The result is a 13% reduction in cycle time.

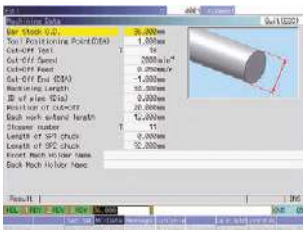


Workpiece

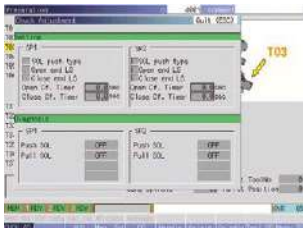
Support screens improve operating convenience

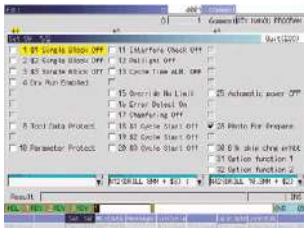


The program screen, organised for easy reading, can be displayed in synchronisation with the editing screen. This simplifies the editing of complex programs with a lot of queuing.

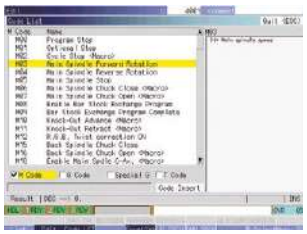


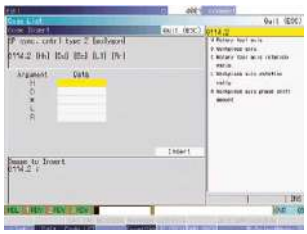
All you have to do is input the machining length, chucking length etc and the escape and approach positions are automatically calculated. This is useful for collision prevention and shortening setup times.

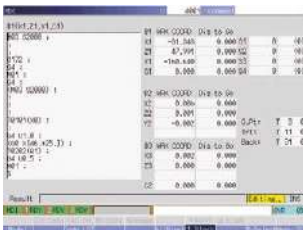




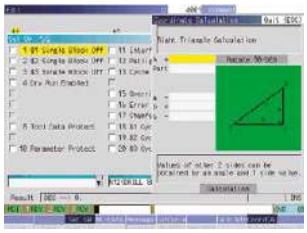
HMI (Human Machine Interface) is adopted.
Graphics displayed for each item and screens that display all the necessary information in one place greatly improve operating convenience.



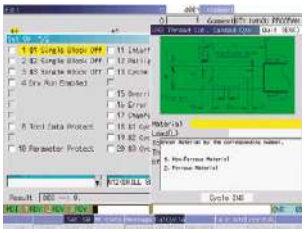




Comprehensive on board G&M code help function.

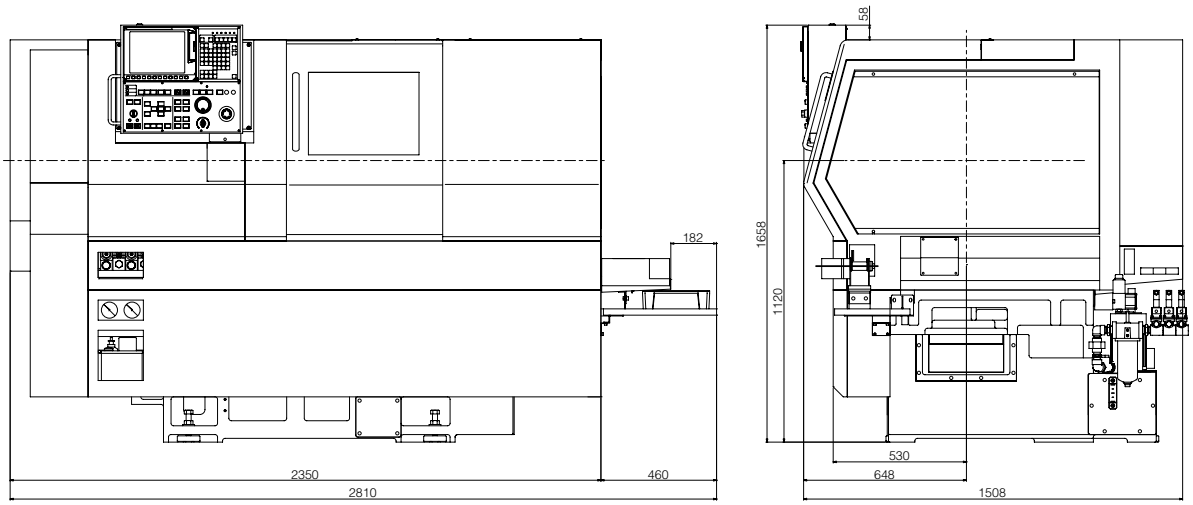


The coordinate calculation function and calculator function incorporated in the NC unit can be used for complex intersection point calculations.

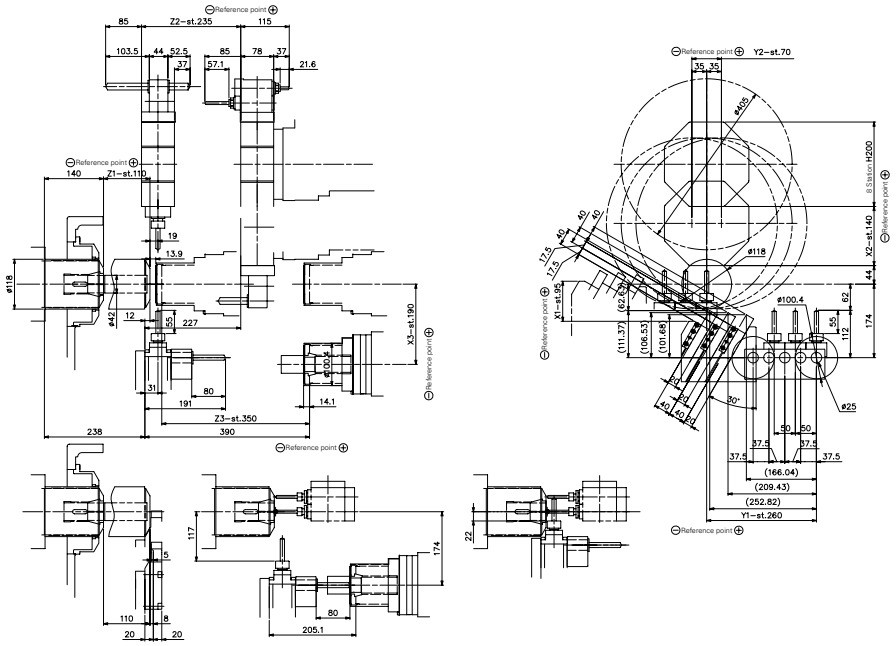


Programs for canned cycles etc. can be created in the conversational style.

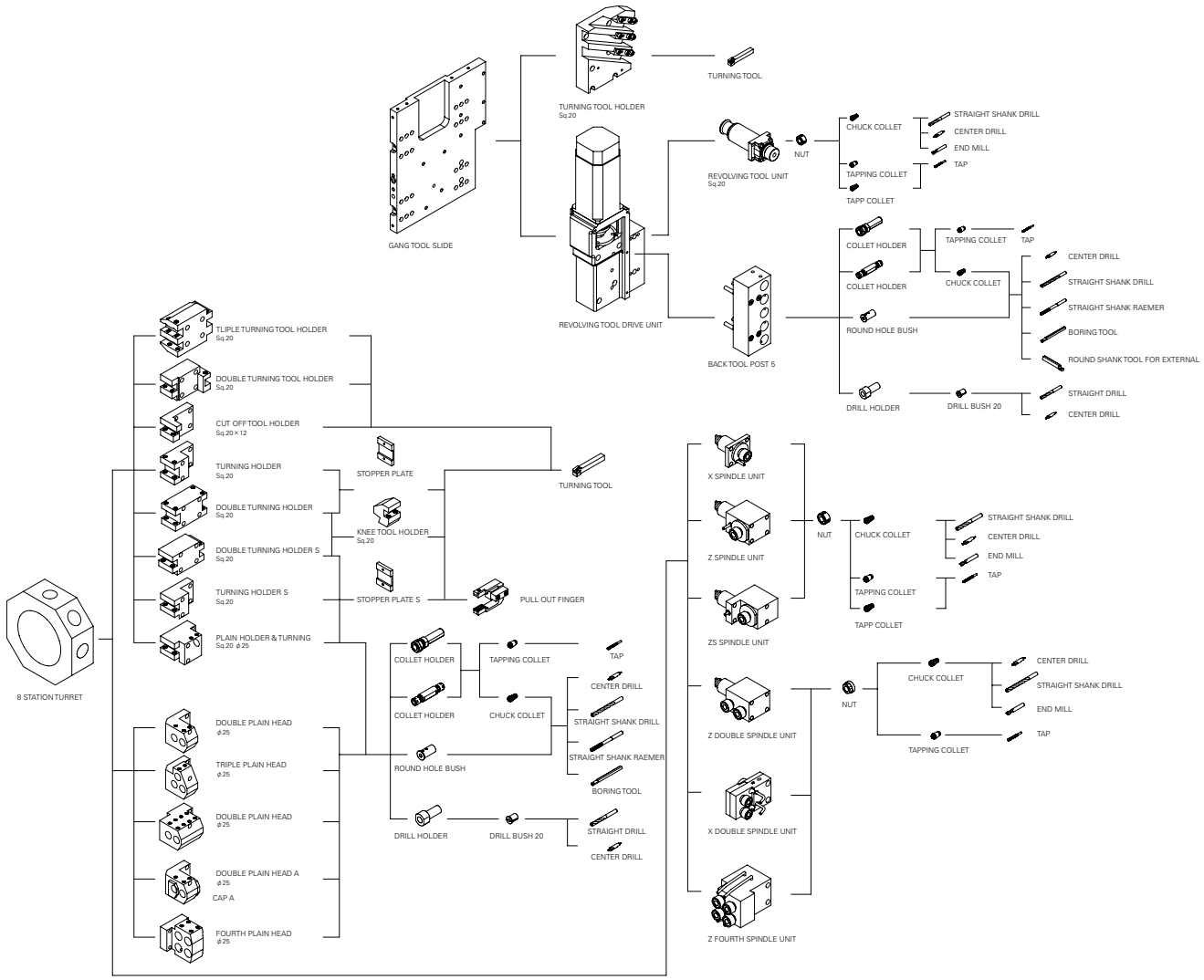
External view



Tooling area



Tooling system



Machine specification

Items		BNA-42GTY	
Machining capacity			
Max. machining diameter of bar work	SP1	ϕ42 mm	
	SP2	ϕ34 mm	
Max. machining length		110 mm	
Spindle			
Number of spindle		2	
Spindle speed range	SP1	6,000 min^{-1}	
	SP2	5,000 min^{-1}	
Spindle minimum index angle	SP1	0.001°	
	SP2	0.001°	
Turret			
Number of turret		2	
Tool for SP1	Turning	3	
Drill/ Bore		-	
Revolving tool		3	
Tool for SP2	Turning	-	
Drill/ Bore		5	
Revolving tool		-	
Type of turret		8 St.	
Revolving tool		8 (Op.)	
Max. number of tools		21- 43	
Shank size of turning tool		20 mm Dia.	
Diameter of sleeve holder		25 mm Dia	
Revolving tool chuck		AR16 (10 mm Dia)	
Tool spindle speed range		6,000 min^{-1}	
Slide stroke			
Traverse rate/ Feed rate	Z1 axis	110 mm	30 m/ min
	X1 axis	95 mm	24 m/ min
	Y1 axis	260 mm	30 m/ min
	Z2 axis	235 mm	20 m/ min
	X2 axis	140 mm	20 m/ min
	Y2 axis	70 mm	12 m/ min
	Z3 axis	360 mm	20 m/ min
	X3 axis	190 mm	12 m/ min
Motors			
Spindle drive	SP1	11/ 7.5kw (15 min/ cont.)	
	SP2	5.5/ 3.7kw (15 min/ cont.)	
Revolving tool drive	Turret	1.0 kW	
Gang tool		1.5 kW	
Tank capacity			
Coolant tank capacity		165 L	
Hydraulic tank capacity		7 L	
Lubricating tank capacity		2 L	
Power supply			
Voltage		AC 200/ 220 V ± 10%	
Capacity		28 KVA	
Fuse		100 A	
Air supply		0.5 MPa	
Machine dimensions			
Machine height		1,680 mm	
Floor space		W 2,350× D 1,475 mm	
Machine weight		3,740 kg	

Options

Spindle air blow, Spindle Brake, High pressure coolant,
Inner High pressure coolant & Air blow, Coolant level swich, Signal tower,
Coolant mist collector, Automatic power shut-off, Chip conveyor, Chip box, Parts catcher, Parts conveyor,
Drill breakage detector, RS-232C, 100V

NC specification

Model device	MITSUBISHI M730VS
Display devise	10.4"colour LCD
Controllable axis	
command specified axes	X1, Z1, Y1, C1 -axis
	X2, Z2, Y2, C2 -axis
	X3, Z3 -axis
auxiliary axes	C3, C4, TI -axis
Control axis groups	3 groups
Input code	ISO
Command input system	Incremental and absolute
Feed command system	Per rotation feed and per minute
Cutting feed rate and Rapid feed override	Max.100%
Tool offset data	80 pairs
Program storage capacity	320 m
Standard function	
On machine program check function	
Manual feed function	
Manual data input (MDI) function	
Operation time display	
Product counter display	
Cycle time check function	
Preparation functions	
Start position automatic return	
Automatic cut-off machining function	
Tool set function	
Spindle speed simultaneous command for 3 spindle	
3 Sets of M code simultaneous command	
Control axis swap function	
Control axes superimpose command	
Arbitrary superposition function	
Function to superimpose 2 pairs of axes	
Background editing	
Simultaneous program editing two control axis group	
Editing support functions	
Calculator function	
Code list display	
Coordinate calculation function	
Spindle C-axis function spindle	
Constant surface speed control	
Cut off confirmation	
Tool nose R compensation function	
Arc radius specification	
Thread cutting canned cycle	
Spindle synchronizing control function	
Milling interpolation	

Option

Helical interpolation, Corner chamferring/ Radius function,
Spindle synchronous tap function, Revolving tool synchronous tap function,
Custom macro, Multiple canned cycles for turning, Canned cycles for drilling,
Inch / metric change

CITIZEN

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