CITIZEN

Miyano

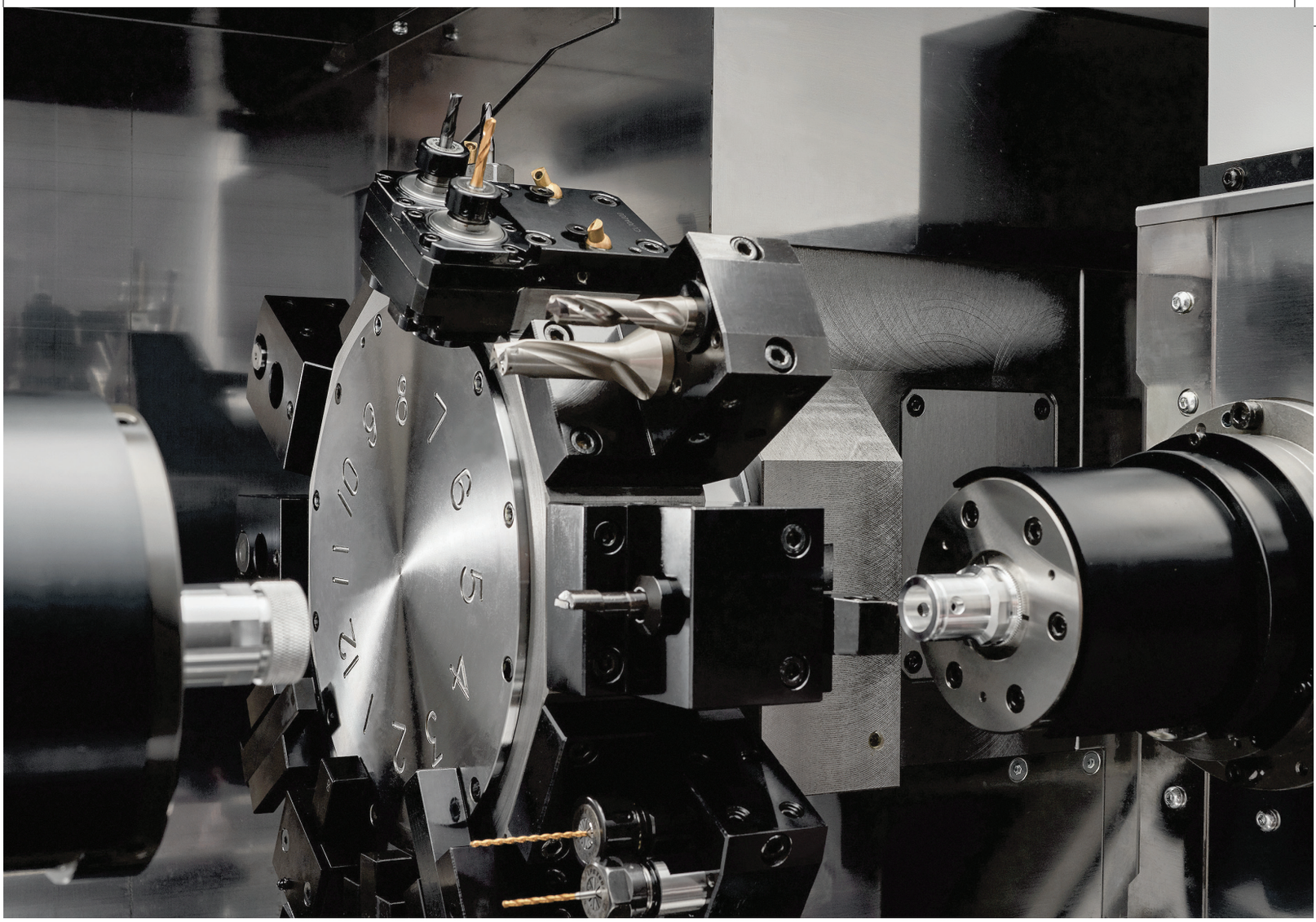
BNA42SY5

Fixed Headstock Type Automatic CNC Lathe

New BNA model with improved basic functions

A surface plate structure, a tradition of the Miyano brand, has been carried over for the bed, an essential element for machining, while both size and weight have been increased in order to improve damping performance. Additionally, the coolant tank capacity has been increased to improve thermal stability. Rigidity of the entire turret tool post has been increased and equipping with a Y axis enables the use of 12 stations. The number of installed tools has also been increased.

The cover has been completely redesigned to improve workability. The opening has been enlarged for easier access and provided with a large window to improve visibility. The port through which chips fall has been enlarged and the removal port has been moved closer to the outer edge of the cover to make it easier to clean away chips. These new NC units are standard-equipped with a dual-check safety function to improve safety and productivity.



Improved performance as a bar-material processing machine

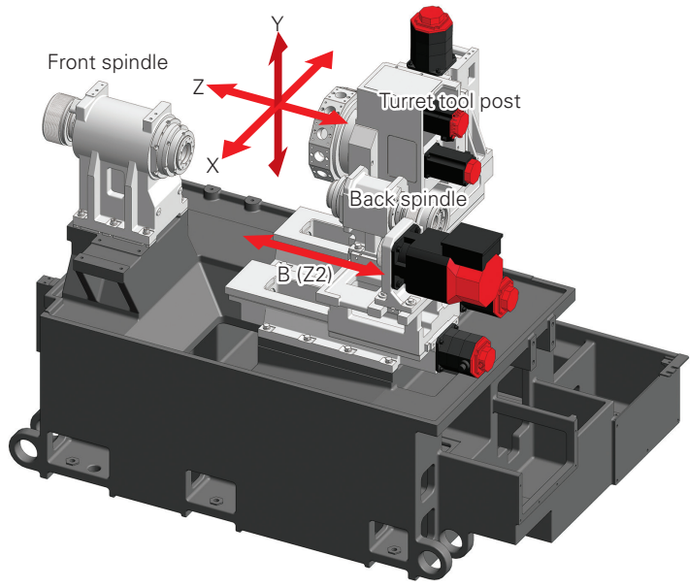
The BNA-42SY has a dual-spindle/ single turret tool post mechanical configuration, and the base and turret rigidity has been increased to improve basic functions. The turret tool post has been equipped with a Y axis to expand the number of installed tools to 12 stations in order to provide the use of a rich assortment of tools, as well as simultaneous left/right machining for superimposed machining and similar processes. The tool holder and rotary tools are the same used for the current BNA Series and the program compatibility is also ensured.

Basic structure and axis configuration

The newly designed base increases the weight of the unit and also improves rigidity. Rectangular lapped slides have been adopted for all slides.

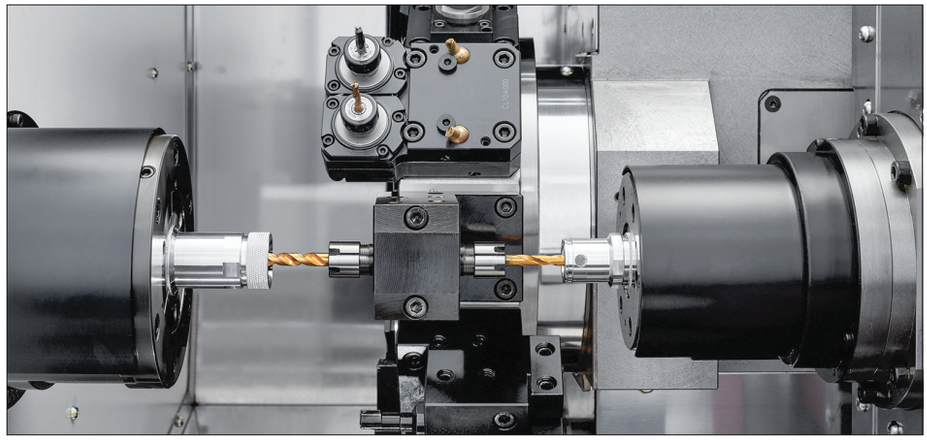
The sliding contact between surfaces provides excellent rigidity and damping performance, as well as strong cutting performance, while also helping to extend the service life of cutting tools.

Additionally, the Z-stroke travel distance has been increased by 50 mm to expand the range of machining available.



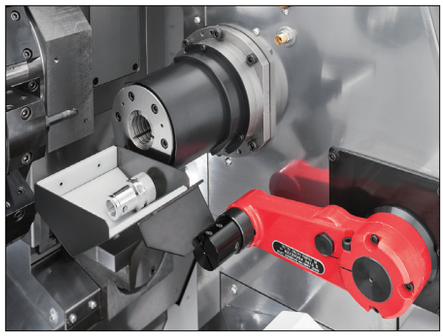
Left/Right simultaneous machining reduces processing time

Simultaneous machining using both left and right-side spindles enables the turret tool post and front spindle to perform machining while the back spindle follows after to perform superimposed and similar types of machining, thereby further reducing the processing time.

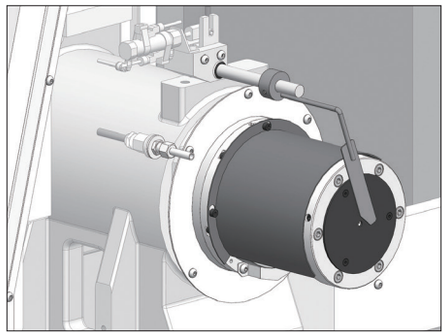


Superimposed machining

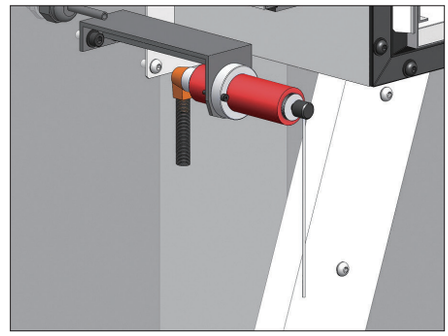
Options



Part catcher
Receives finished workpieces. This option is indispensable for bar work.

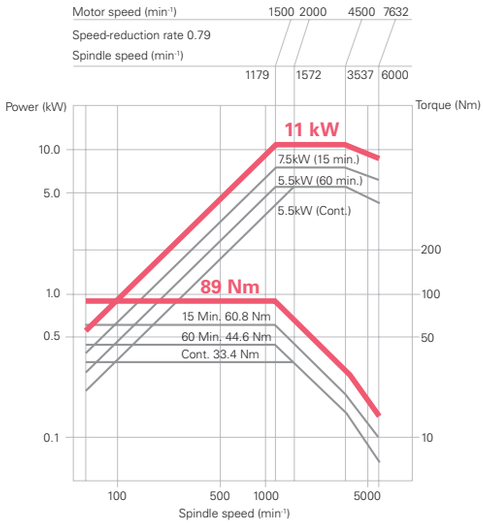


Cut-off confirmation
This is a function that moves the sub spindle to the retract position at a low thrust after the workpiece has been cut off to check for failure in the cut-off operation.



Drill breakage detector
Drill breakage is detected by the swing cylinder.The machine stops when breakage is detected, and a second accident can be protected.

Short-term increase in rated power of the front spindle



Power is increased up to 11 kW during spindle acceleration and deceleration to help reduce the cycle time.

Gantry loader provided as standard equipment

Standard equipment includes mounting eyes for the legs of the gantry loader, a loader hand insertion space above the spindles, and a loader interface. Compatibility is provided for installation of a gantry loader by another manufacturer. An automatic shutter OPT that secures space for the loader hand to enter the machine can also be mounted.

LFV Option

LFV* 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.

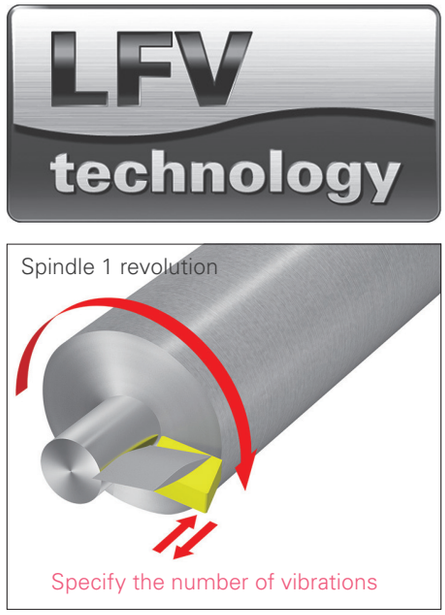
It reduces various problems caused by chips entangling with the product or tool, and is effective for small-diameter deep hole machining and the machining of difficult-to-cut materials.

* "LFV" is a registered trademark of Citizen Watch Co., Ltd.

LFV mode 1

Ideal for outer / inner diameter machining and groove machining

Multiple vibrations per spindle revolution



Type	X, Z	Y	B(Z2)
BNA42SY	○	×	×

Note 1. LFV machining can be performed simultaneously on a maximum of two axes.

Comparison of chips

Material SUS304 Weight: 14.3 g (same scale)

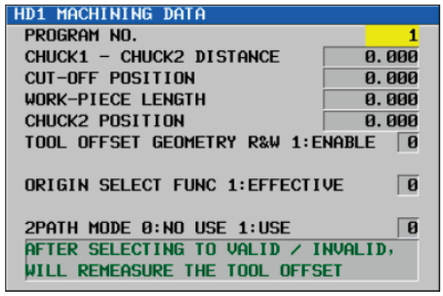
Chips generated with LFV cutting

Chips generated by customary cutting

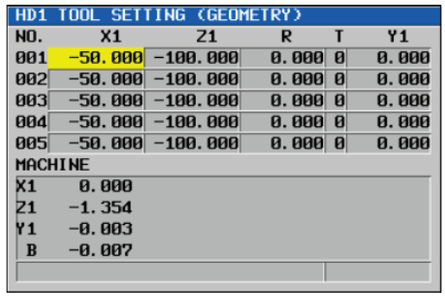
Movie 1

Movie 2

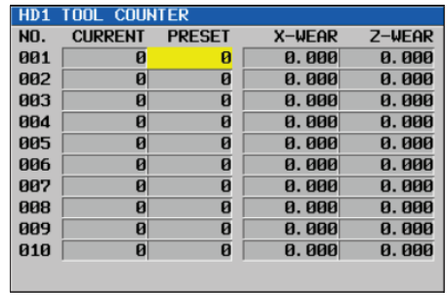
Machining support screens



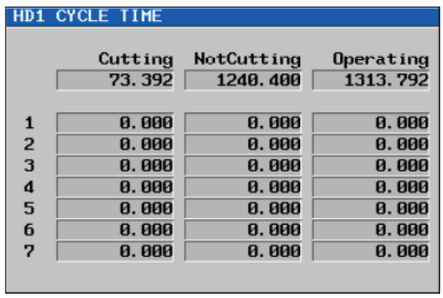
Machining data
Entering the machining length and position of the cut-off here makes it easier to measure geometry offsets and to mount tools.



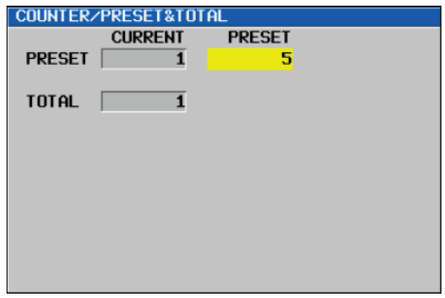
Tool setting
Used to measure geometry offsets. It can also be used for tool mounting support, to ensure that the overhang of all tools is fixed at a constant value.



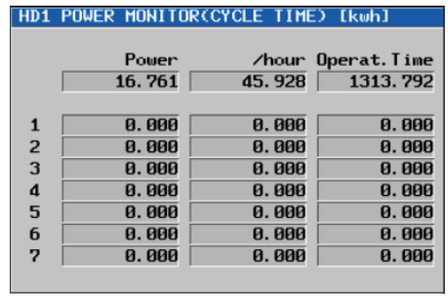
Tool counters
Informs you of the timing (count-up) for tool changes in accordance with the set tool counter stop value. You can also enter wear offsets.



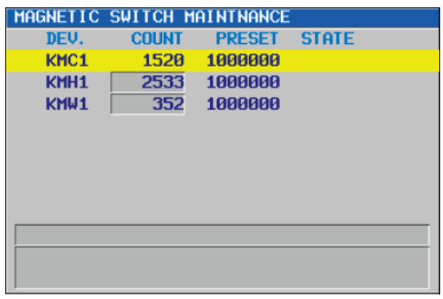
Cycle time
Allows you to measure the cutting time, non-cutting time and running time in each cycle.



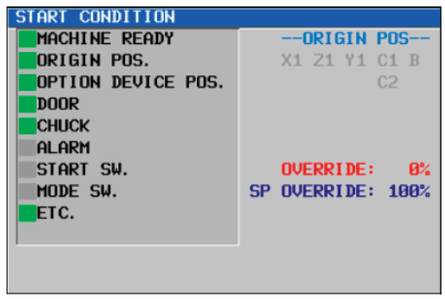
Total & preset counter
Used to set the stop value for the product counter and to reset the count value.



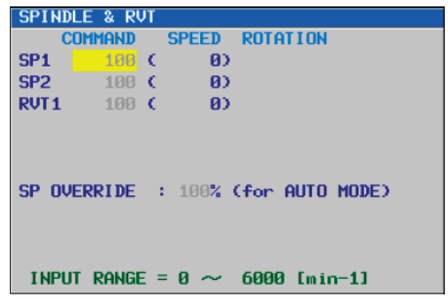
Power consumption monitor
Allows monitoring of the power consumption per cycle time, day, or month.



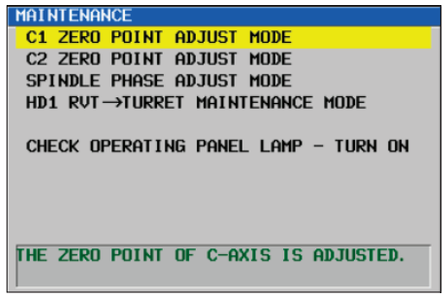
Electromagnetic switch maintenance
Used to set the ON/OFF usage count range for electromagnetic switches for notifying the replacement interval for these switches.



Start condition screen
Displays information on the start conditions for automatic running.



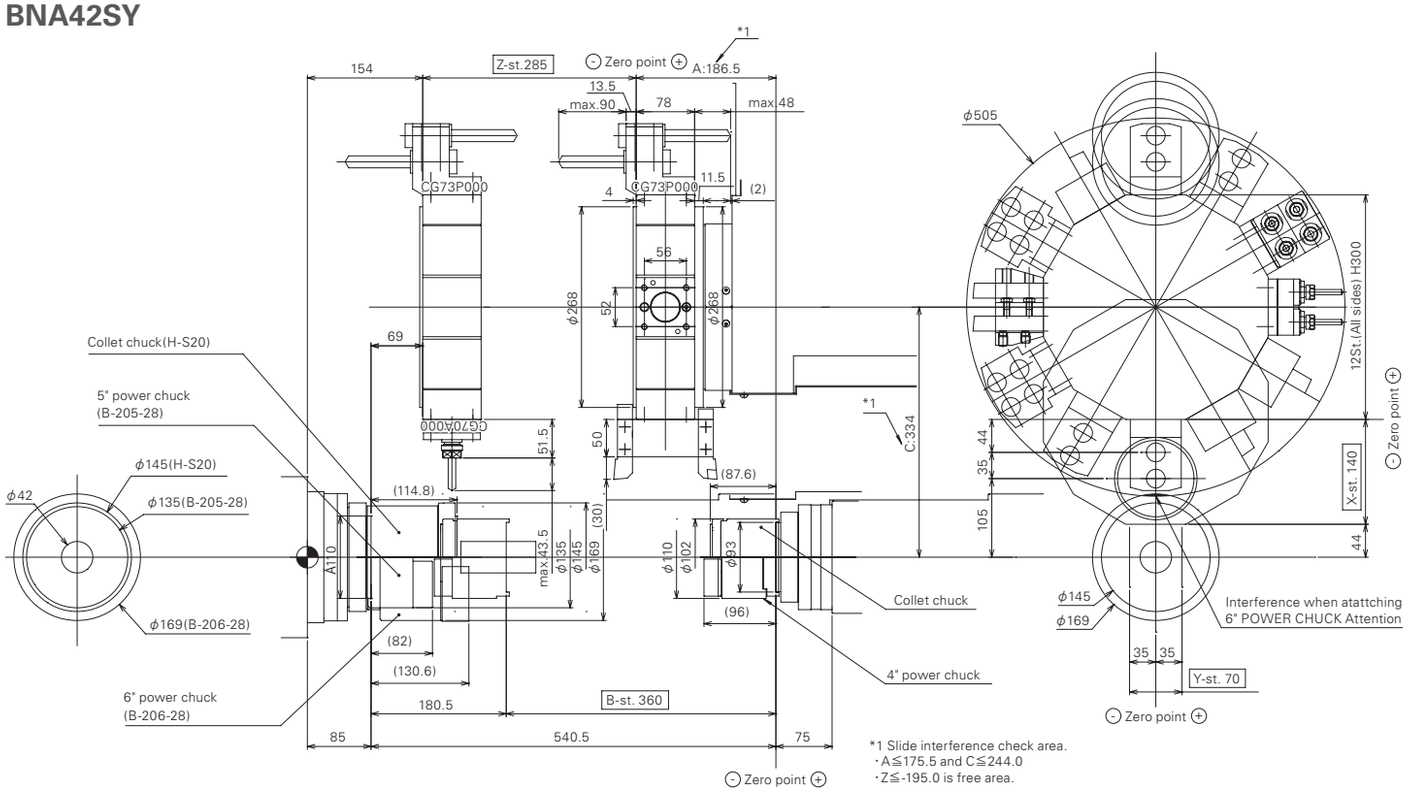
Spindle and revolving tool unit
Allows you to set the rotational speed (in manual operation) of the spindle and revolving tools, and to set the spindle override.



Maintenance
Perform maintenance work according to the display.

Tooling area

BNA42SY



Environmental Performance Information

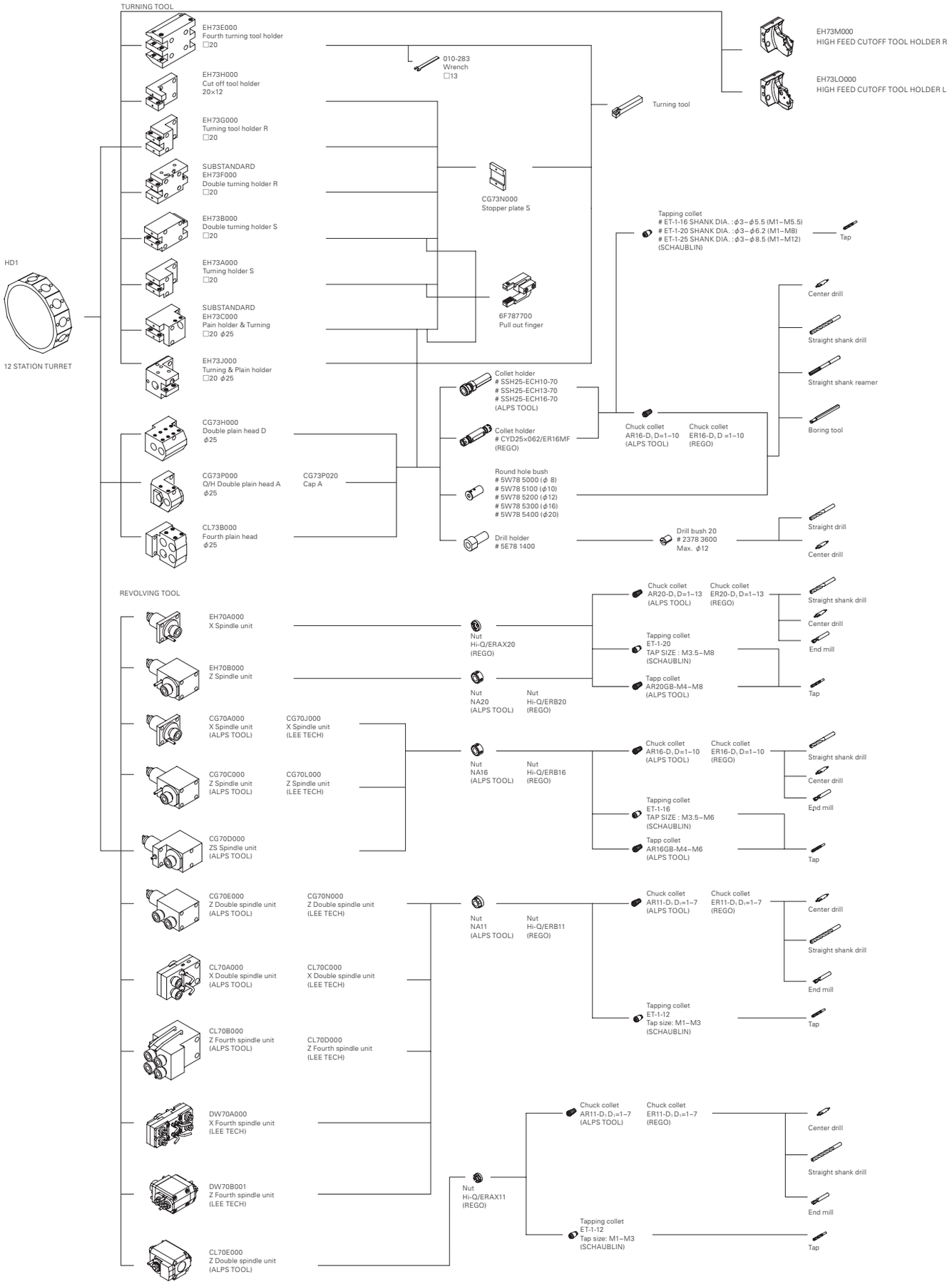
	Item	BNA-42SY5
Power consumption	Standby power	0.661 kW
	Power consumption with model workpiece *1	0.187 kWh/cycle
	Power consumption value above converted to a CO2 value *2	89.0 g/cycle
Air consumption	Required air flow rate	52.7 NL/min (without air blow) 173 NL/min(with air blow)
Lubricating oil consumption	At power ON	3.0 cc/15 min
Noise level	on JIS	72 dB
Recycling Indication of the material names of plastic parts		Detailed in the Instruction Manual *3
Environmental management		We have obtained ISO14001 certification. We pursue "Green Procurement", whereby we make our purchases while prioritizing goods and services that show consideration for the environment.

*1 This is the power consumption in program operation (when not cutting) for one of our standard test pieces, shown for the purpose of comparing the environmental performance with that of existing models.

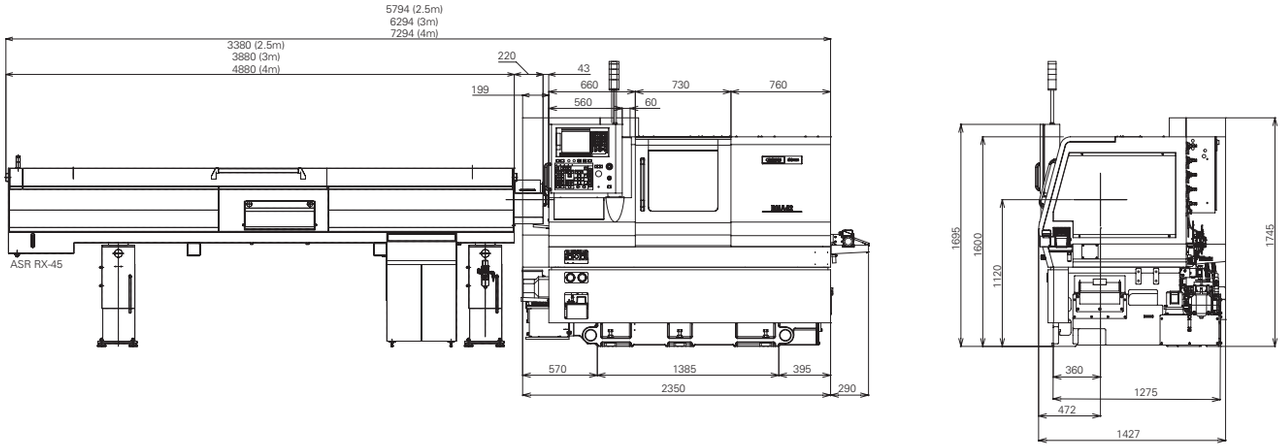
*2 This is the value converted in accordance with the CHUBU Electric Power CO_2 emissions coefficient for 2015 as published by the Ministry of the Environment.

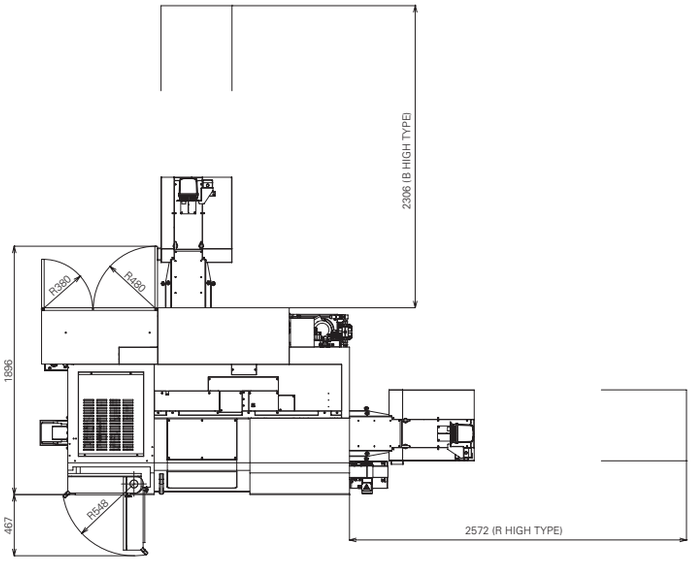
*3 If polyvinyl chloride (PVC) and fluoric resin are not processed correctly, they can generate harmful gases. When recycling these materials, commission a contractor that is capable of processing them appropriately.

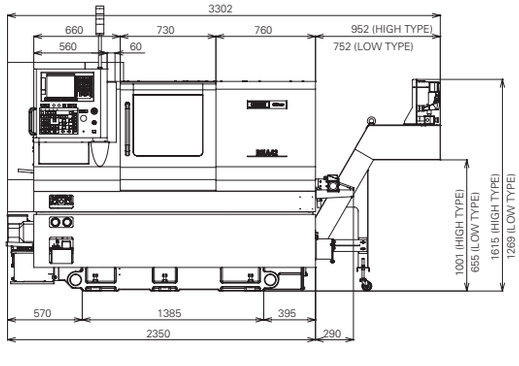
Tooling system

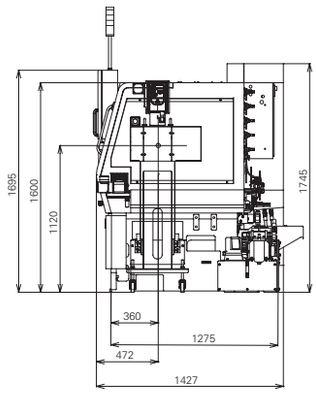


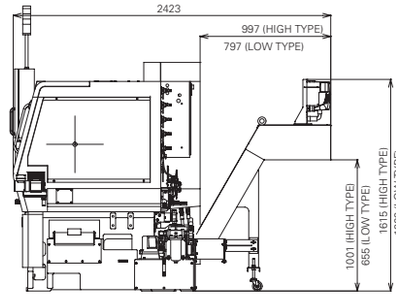
External view











Machine Specifications

Item		BNA-42SY5
Capabilities/Capacities		
Max. machining length		100 mm
Standard machining diameter (Chuck diameter)	SP1	42 mm dia.
	SP2	34 mm dia.
Travel distance		
Turret slide travel distance	X axis	140 mm
	Z axis	285 mm
	Y axis	70 (+/-35) mm
Back spindle slide travel distance	B axis	360 mm
Spindles		
Number of spindles		2
Spindle speed	SP1	60 to 6,000 min^{-1}
	SP2	50 to 5,000 min^{-1}
Closing tube through-hole diameter	SP1	43 mm dia.
	SP2	30 mm dia.
Collet chuck type	SP1	Hardinge S20, DIN173E, B&S #22D, JPN34, Hainbuch
	SP2	JPN, DIN171E, DIN173E, B&S #22
Power chuck type	SP1	5" hollow chuck
	SP2	4" hollow chuck
Tool post		
Number of tool posts		1
Type of tool post		12 ST.
Opposite side distance of tool post		300 mm
Max. turning radius of tool post		505 mm dia.
Dimensions of tools used		20 mm sq.
Dimensions of tool post holes		25 mm dia.
Rotary tools		
Number of installed rotary tools		Max. 12
Type of rotary tool drive		Independent clutch drive
Rotating speed of rotary tools		50 to 5,000 min^{-1}
Machining capacities	Drill	Max. 10 dia.
	Tap	Max. M6×1
		(Limited to spiral and point taps for M8×1.25)
		Max. M8×1.25 for BSBM
Feed rate		
Rapid feed rate	X axis	20 m/min
	Z axis	20 m/min
	Y axis	12 m/min
	B axis	20 m/min
Slide thrust		
	X axis	5 kN
	Z axis	5 kN
	Y axis	6.7 kN
	B axis	5 kN
Tailstock		
	Max. travel distance	200 mm
	Morse taper size	MT2
	Max. slide thrust	4.3 kN (at 3.4 MPa)
	Min. slide thrust	0.57kN (at 0.45 MPa)
	Drive method	Hydraulic
Motors		
Spindle motor	SP1	11/7.5/5.5 kW (15%/15 min/cont.)
	SP2	5.5/3.7 kW (15 min/cont.)
Rotary tools motor		2.8/1.0 kW
Coolant pump motor		0.25 kW
High-pressure coolant motor		1.1/0.75 kW (60/50Hz)
Required power source		
Power supply		AC 200/220 +5%/-10%, 50/60 Hz ±1%
Power supply capacity		26 kVA
Air pressure source		0.5 MPa
Fuse capacity on facilities side		100 A
Tank capacities		
Hydraulic tank capacity		18 L
Lubricating oil tank capacity		2 L
Coolant tank capacity		235 L
Machine size		
Machine height		1,745 mm
Required floor surface area		W 2,350×D 1,433 mm
Machine weight		3,650 kg

NC specifications	BNA-42SY5
Control unit	FS.0i-TF PLUS
Control axis	
HD1	X1,Z1,Y1,B1, C1, C2, E1 (Turret), A1 (Rotary tools) During superimposed operation: X1, Z1, Y1, C1, E1 (Turret) A1 (Rotary tools)
HD2	During superimposed operation: Z2, C2,
Feed axis absolute position detector	X1,Z1,Y1,B
Min. set unit	0.001 mm/0.001 deg.
Interpolation function	
Positioner	G00
Linear interpolation	G01
Circular interpolation	G02, G03 (multiple quadrants available)
Dwell	G04
Threading	G32
Multiple threading	G33
Feed function	
Rapid feeding override	0 to 100% (10% increments)
Cutting feed speed override	0 to 150% (10% increments)
Per minute feed and per rotation	G98/G99
Manual handle feeding	x1, x10, x100
Reference point return	G28
Reference point return chuck	G27
2nd reference point return	G30 or G30P2
Program input function	
Tape code	EIA/ISO auto-detection
Absolute commands	X,Z,Y,C,B
Incremental commands	U, W, V, H
Programmable data input	G10
Coordinate system settings	G50
Workpiece coordinate system	G54 to G59
Program storage and editing	
Program storage capacity	1 Mbyte (Two system total)
Number of registered programs	800 (Two system total)
Spindle and supplementary functions	
Spindle functions	S4 digits
Supplementary functions	M3 digits
Constant peripheral speed control	G96
Tool and tool compensation functions	
Tool functions	T4 digits command
	Upper 2 digits: Tool selection & Geometry offset
	Lower 2 digits: Wear offset
Nose radius compensation	G40,G41,G42
Operating functions	
Optional stop	M01
Jog feeding	0 to 1,260 mm/min
Input/Output interface	
PC card slot and USB memory slot	
Automatic operation	
One-cycle/Continuous operation, Single block, Block delete, Machine lock	
Optional block skip, Dry run, Feed-hold, Optional stop	
Other	
10.4" color LCD, Supporting multiple languages, Decimal-point input, Manual pulse generator	
Memory protection, AC digital servos, etc.	
Standard NC functions	
Chamfering/corner R, Background editing, Operating time/Number of parts display	
Canned composite cycles (G70 to G76), Spindle synchronization function (SY only)	
Spindle rigid tapping (Main and sub (SY only))	
Cylindrical interpolation, Custom macro B, Canned drilling cycles (G80 to G86)	
Tool service life management, Superimposition control function (SY only)	

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