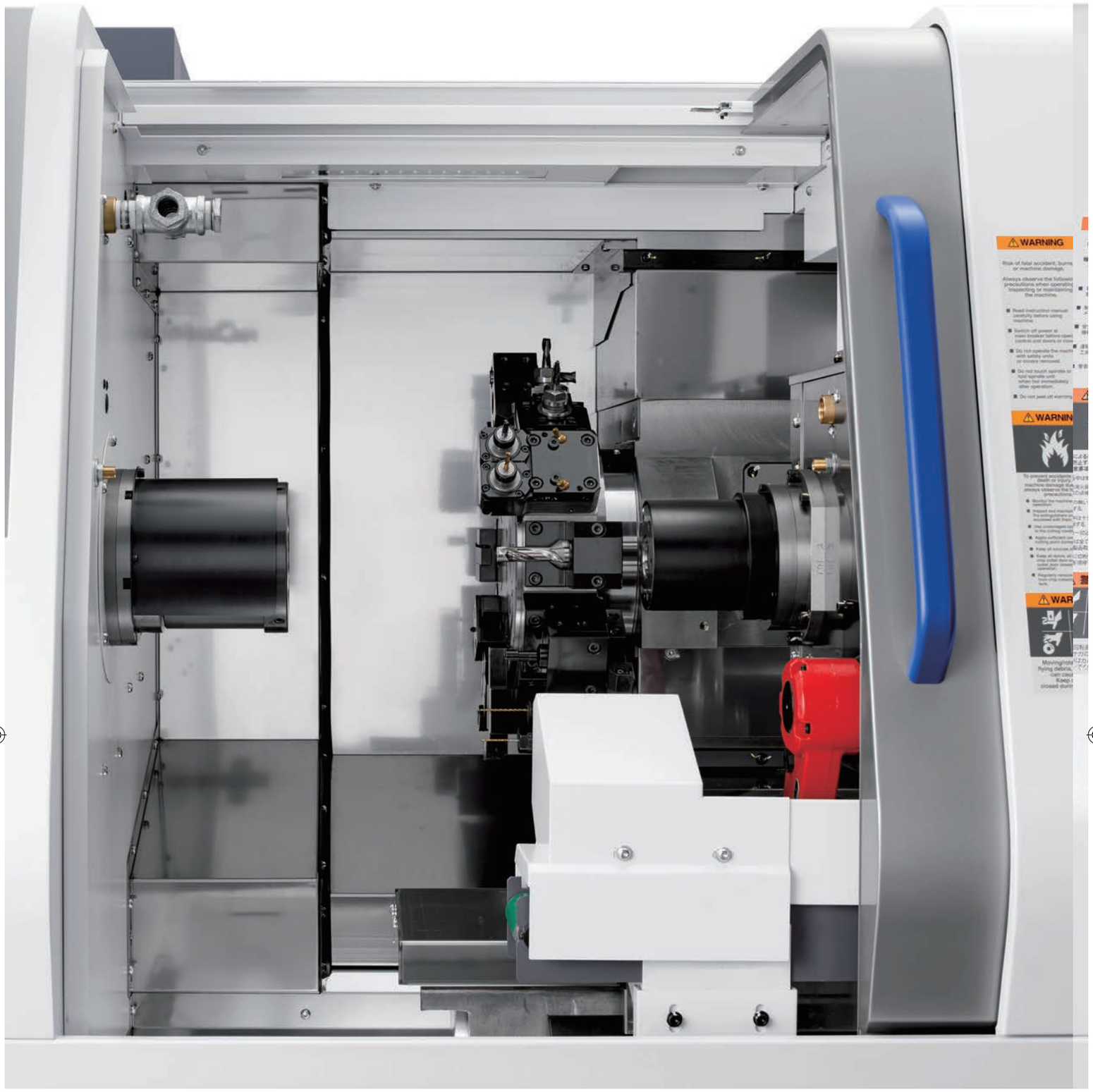
CITIZEN

Miyano

BNA42 SY/CY

Fixed Headstock Type CNC Automatic Lathe

LFV technology



BNA42SY

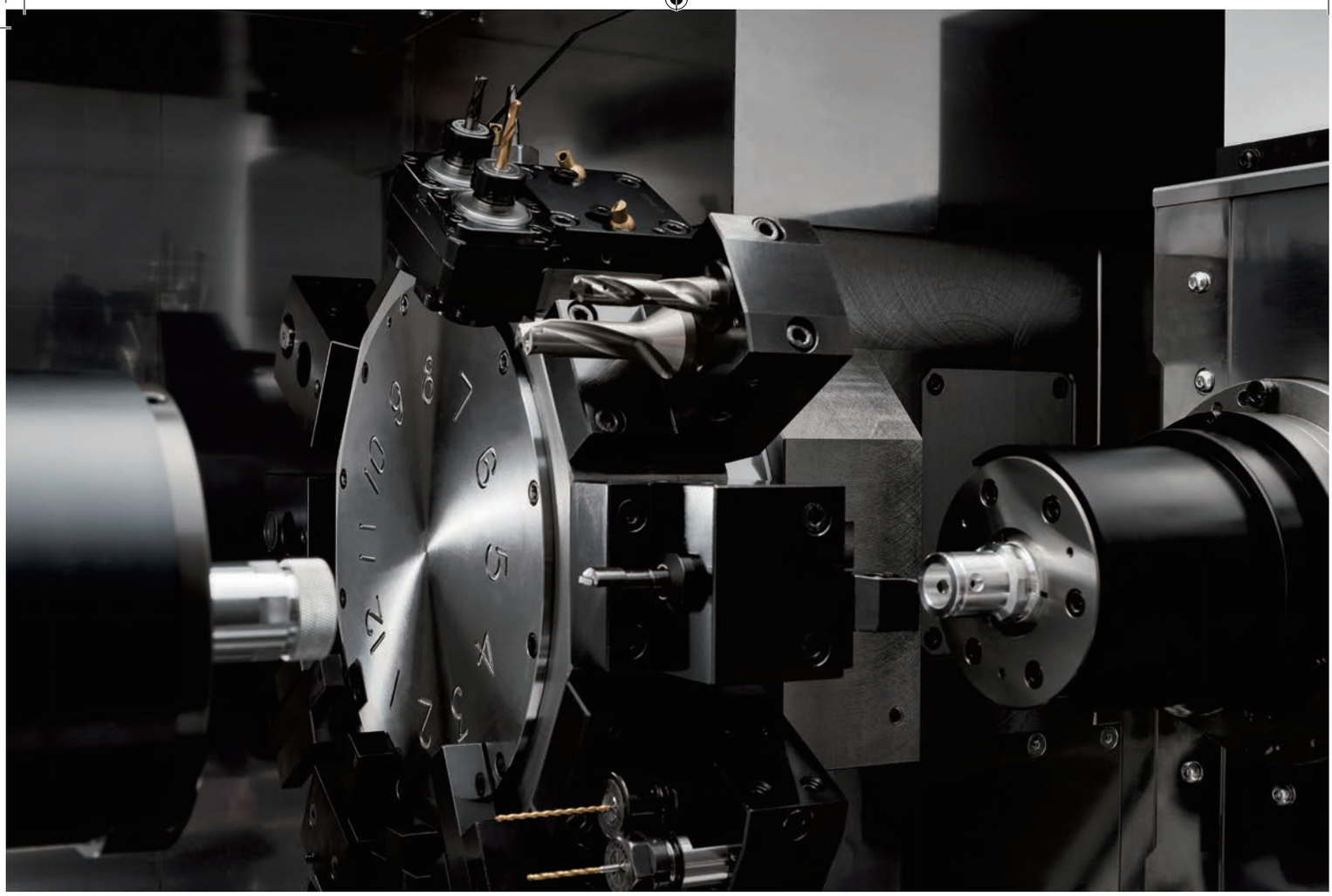
Two BNA Series models with improved basic functions

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.

BNA42CY

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.

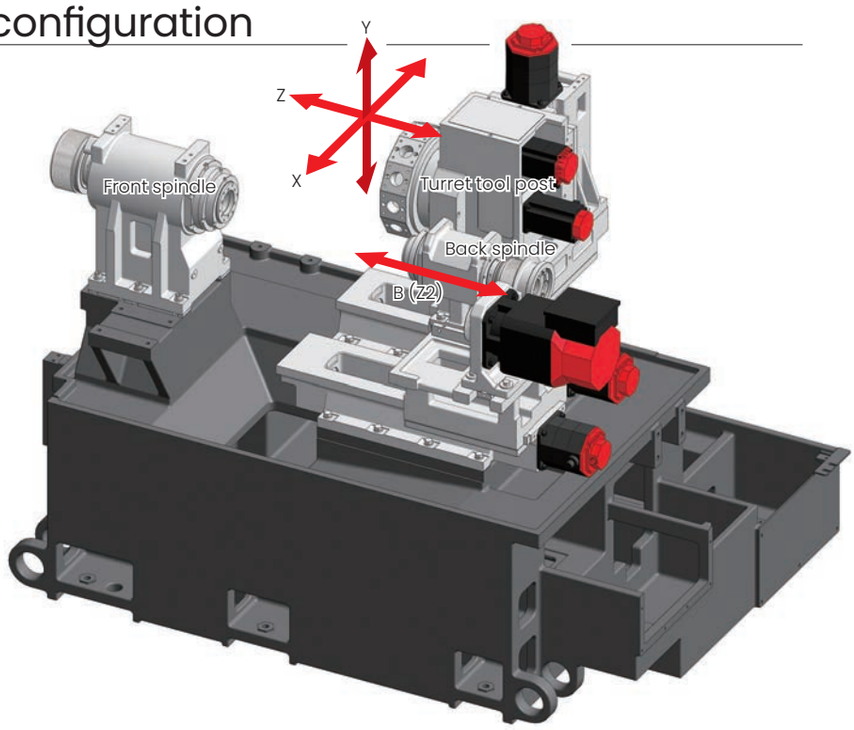


SY type with improved performance as a bar-material processing machine

The SY type 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.

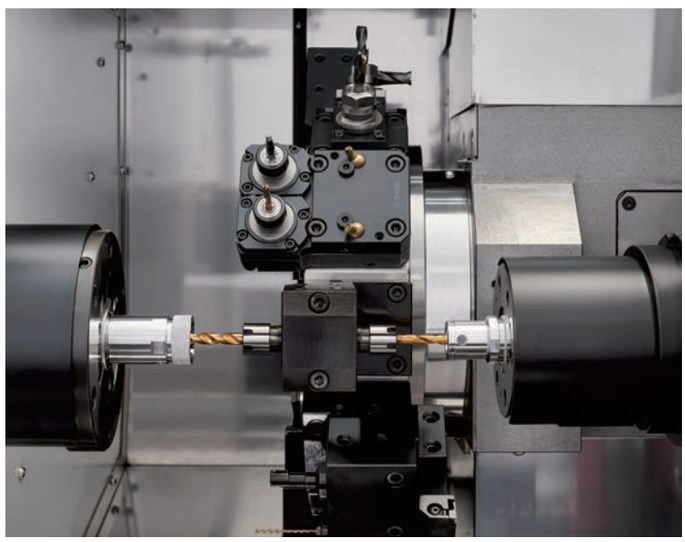
Basic structure and axis configuration

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 to 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

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.

Type	X, Z	Y	B(Z2)
BNA42SY	O	×	×

Note 1. LFV function is available only for BNA42SY

Note 2. LFV machining can be performed simultaneously on a maximum of two axes.

LFV technology

LFV mode 1

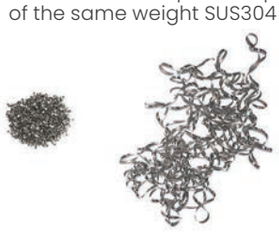
Ideal for outer/inner diameter machining and groove machining

Multiple vibrations per spindle revolution

MOVIE 1

MOVIE 2

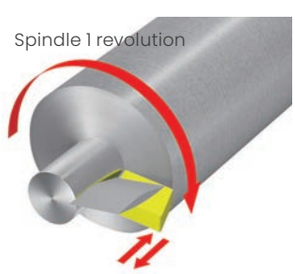
Difference in shape of chips of the same weight SUS304



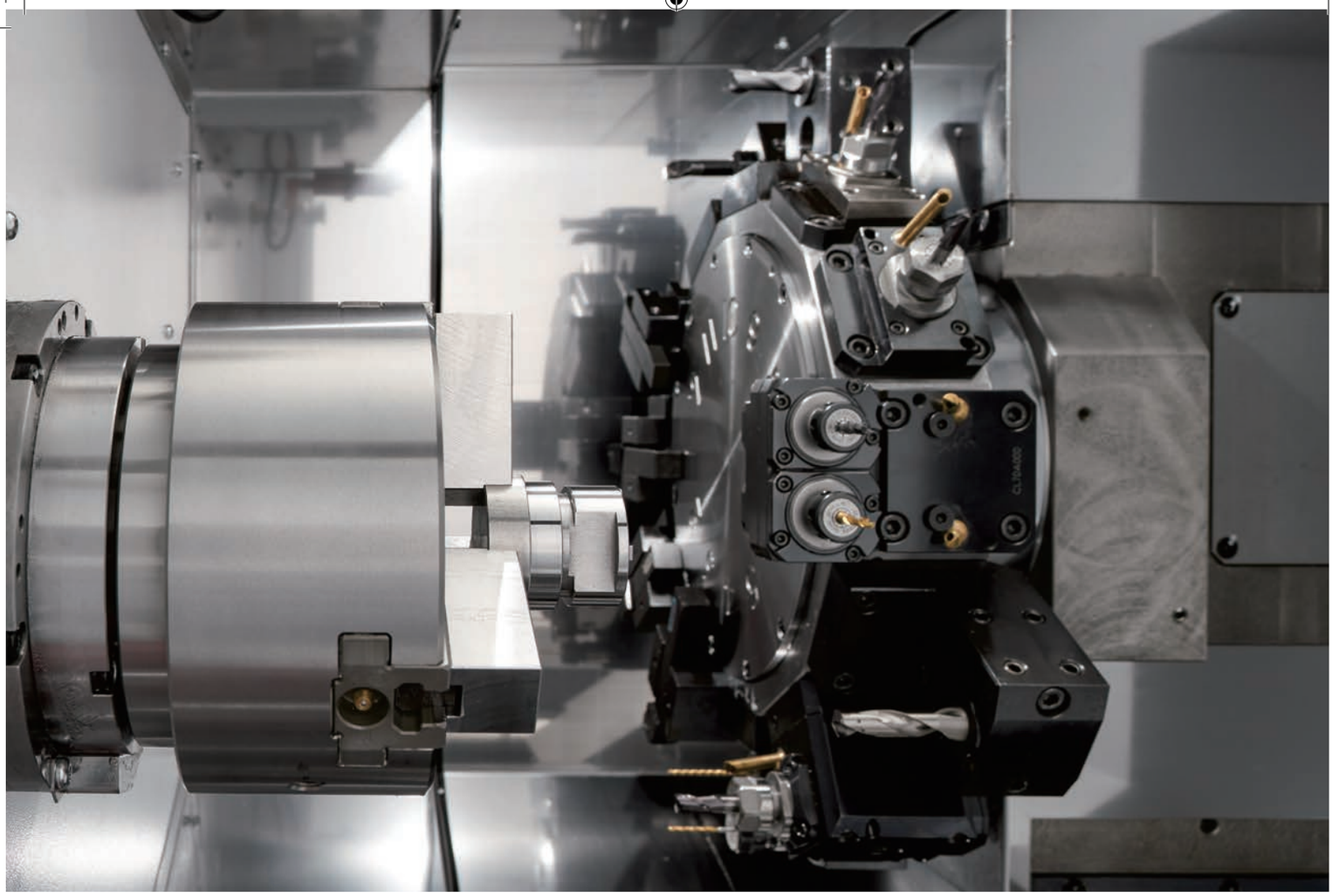
LFV

Conventional cutting

Spindle 1 revolution



Specify the number of vibrations

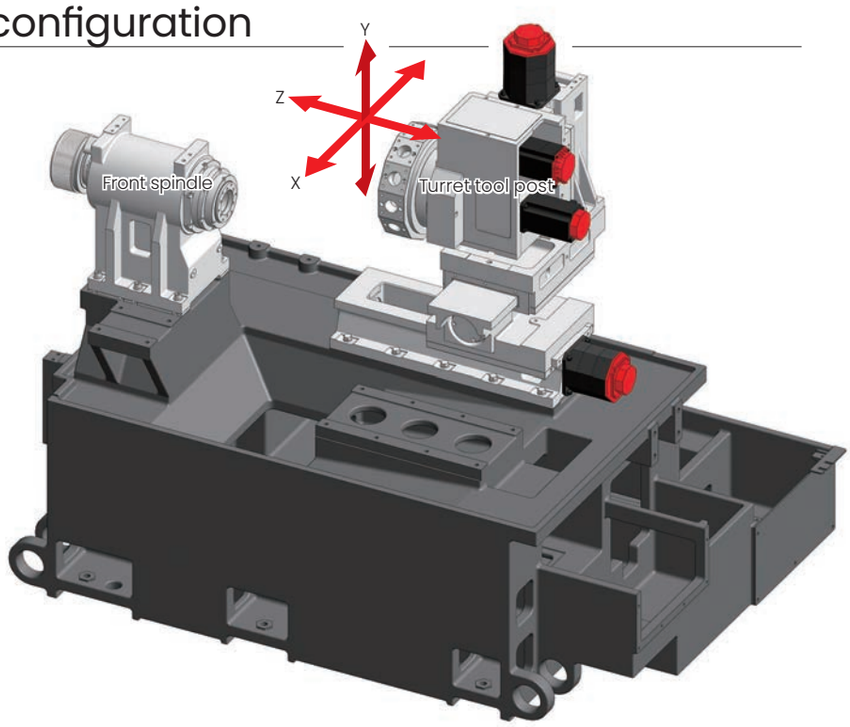


CY type enables use as a chucker machine

The CY type was developed under the concept of "Bar and Chucker".
The simple structure of one spindle for one turret tool post can not only perform bar material machining, but you can also combine options such as power chucks or a chip conveyor with rear discharge together with supply/discharge units, such as a gantry loader manufactured by another company, in order to incorporate the CY type into a production line as a chucker machine.

Basic structure and axis configuration

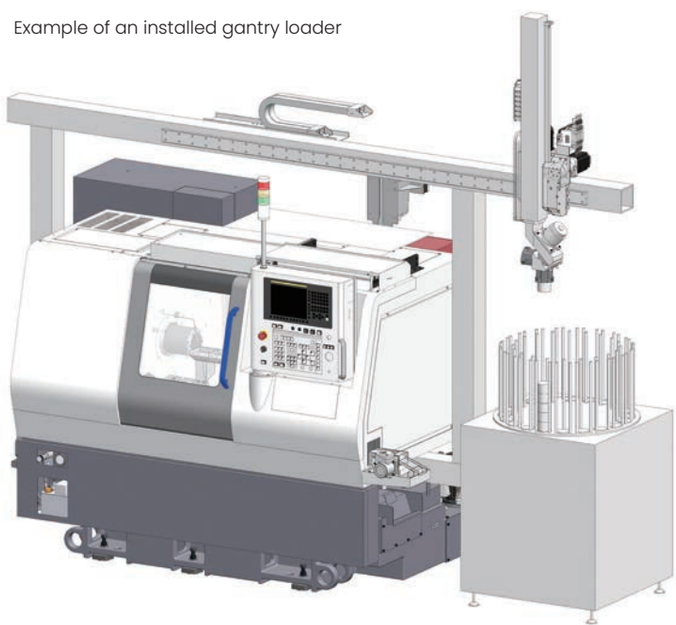
The newly designed base increases the weight of the unit while also improving rigidity.
Combining with a tailstock[OPT.] enables use of long workpieces.
Mounting eyes for the legs of the gantry loader are provided on the left and right side faces of the bed.
You can select whether the chip conveyor discharges to the right or the rear.



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.

Example of an installed gantry loader

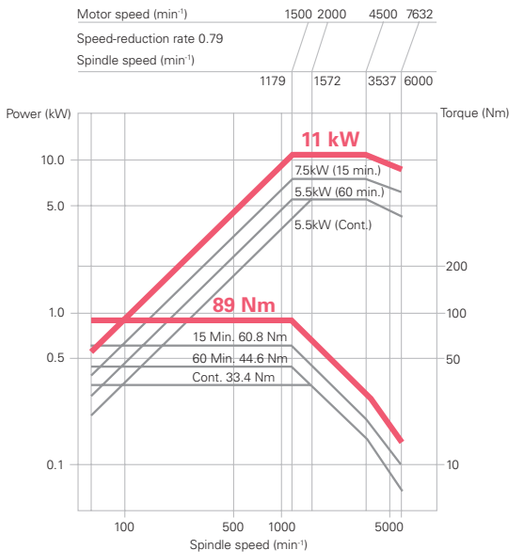


Rear-discharge chip conveyor [OPT.]

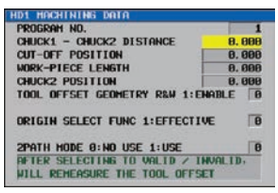
This chip conveyor allows for rear discharge in addition to the current side discharge. This increases the options for the installation method used.

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.

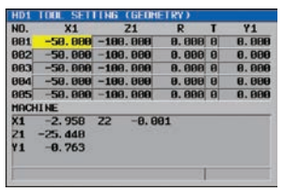


Machining Support Screens



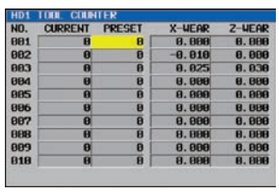
Machining data

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



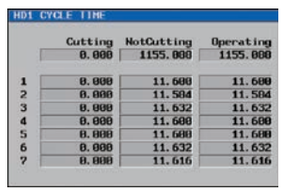
Tool setting

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.



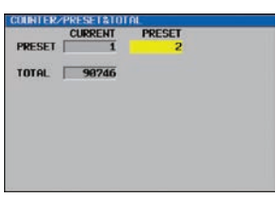
Tool counters

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.



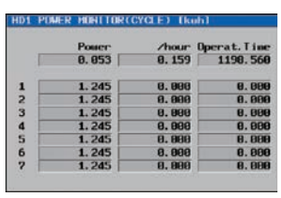
Cycle time

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.

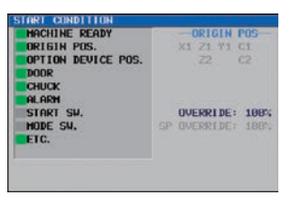


Power consumption monitor

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

Spindle and revolving tool unit

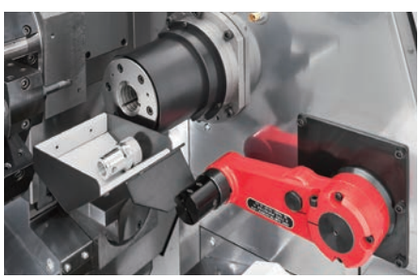
Allows you to set the rotational speed (in manual operation) of the spindle and revolving tools, and to set the spindle override.



Start condition screen

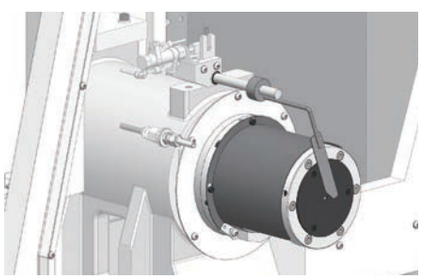
Displays information on the start conditions for automatic running.

Options



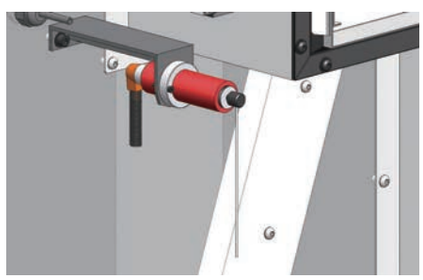
Part catcher

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.

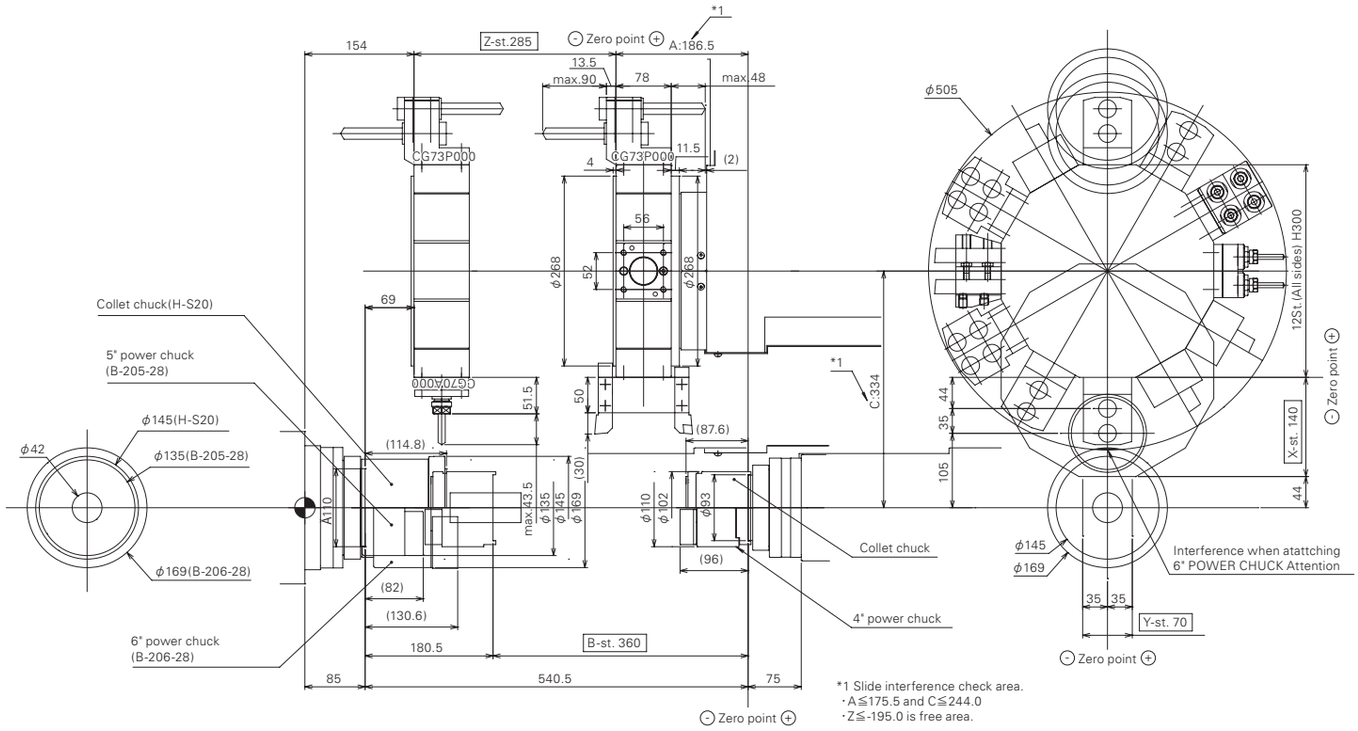


Drill breakage detector

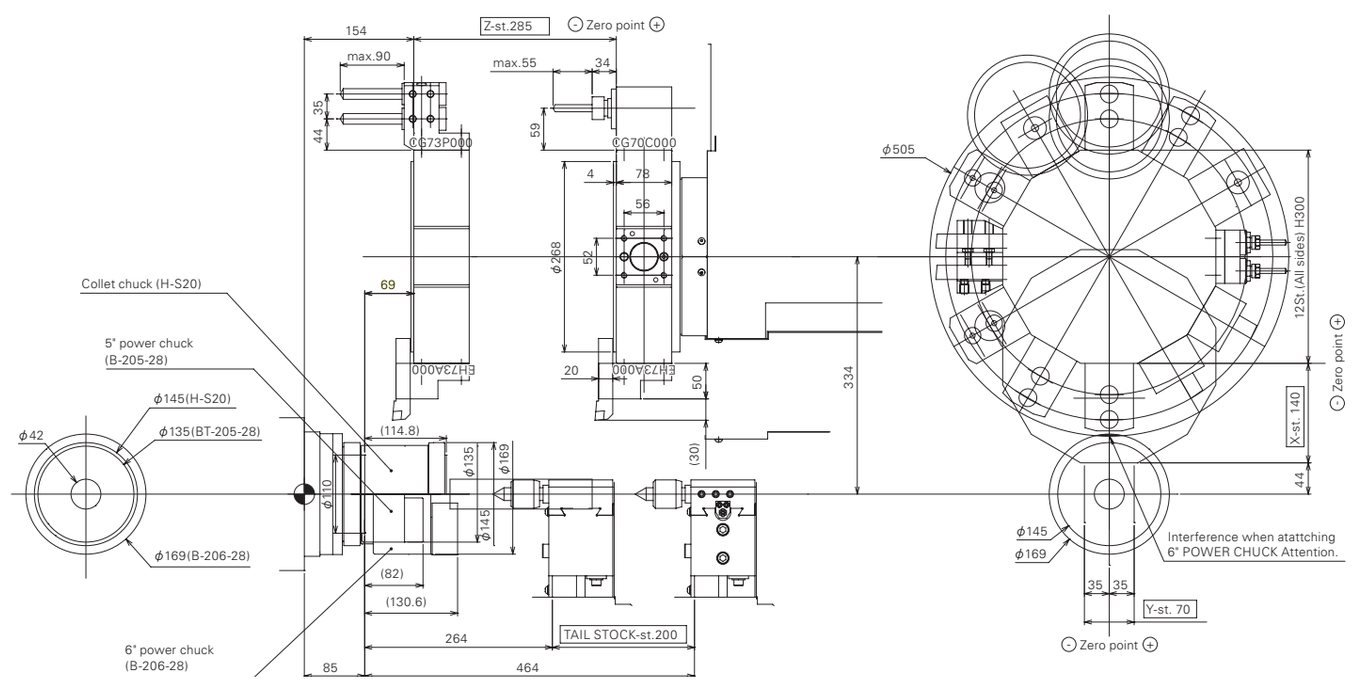
Drill breakage is detected by the swing cylinder.The machine stops when breakage is detected, and a second accident can be protected.

Tooling area

BNA42SY

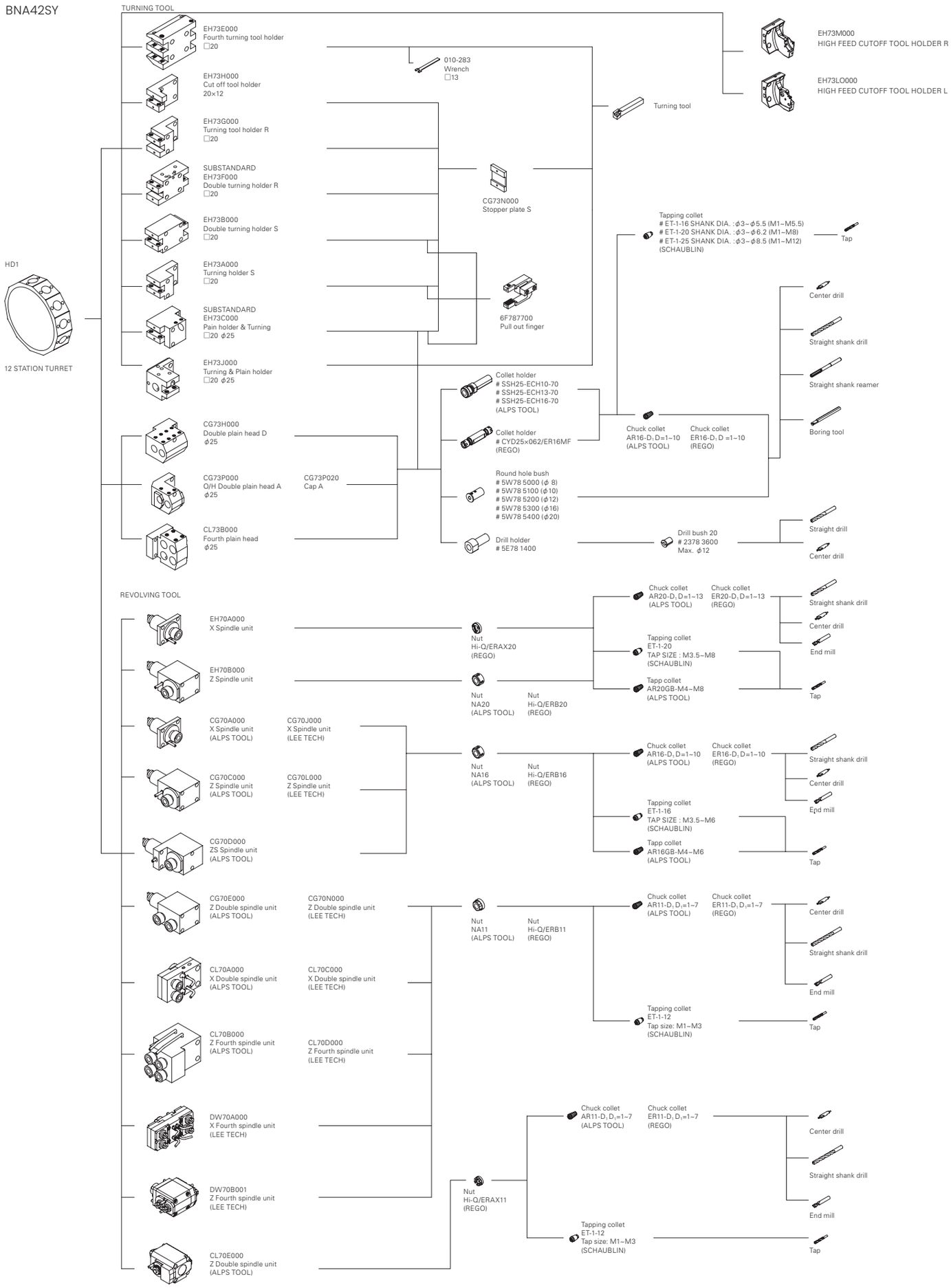


BNA42CY

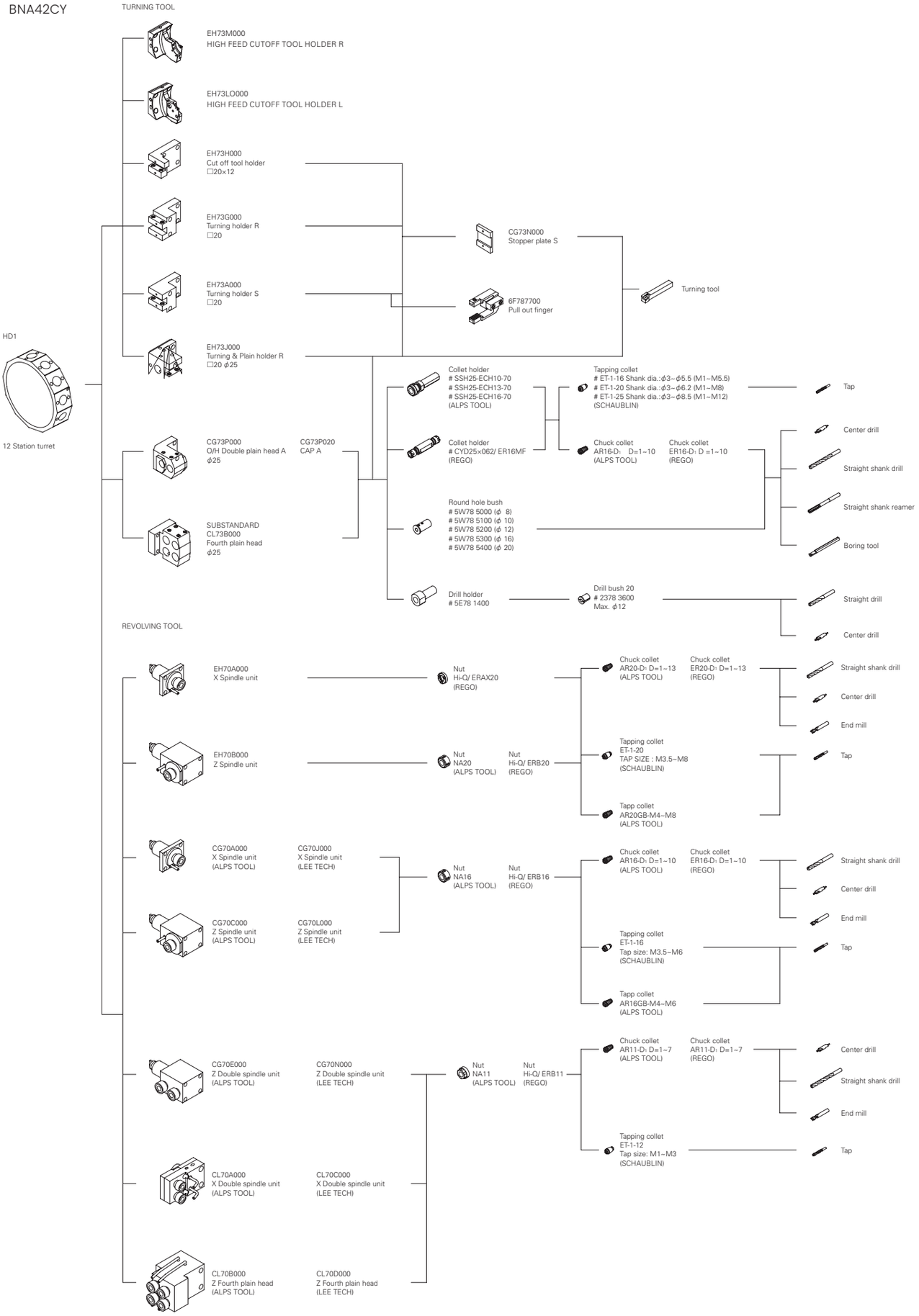


Tooling system

BNA42SY

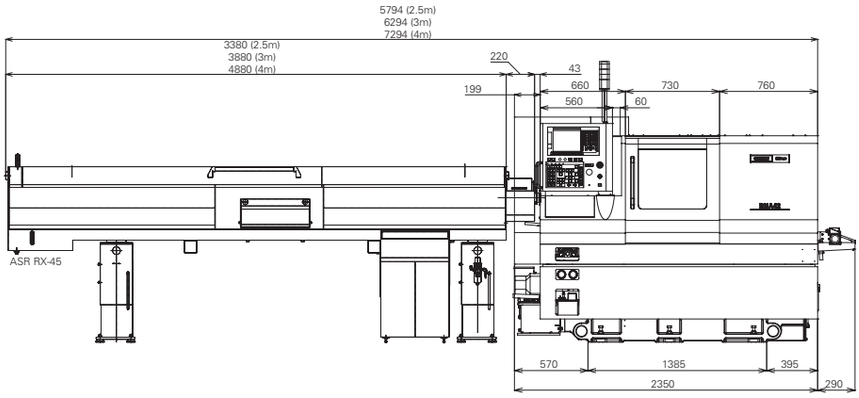


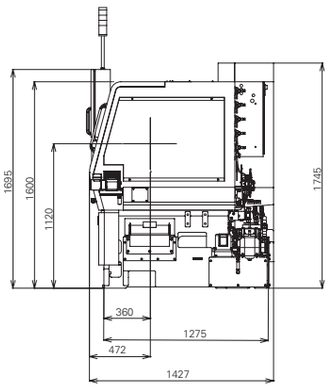
BNA42CY

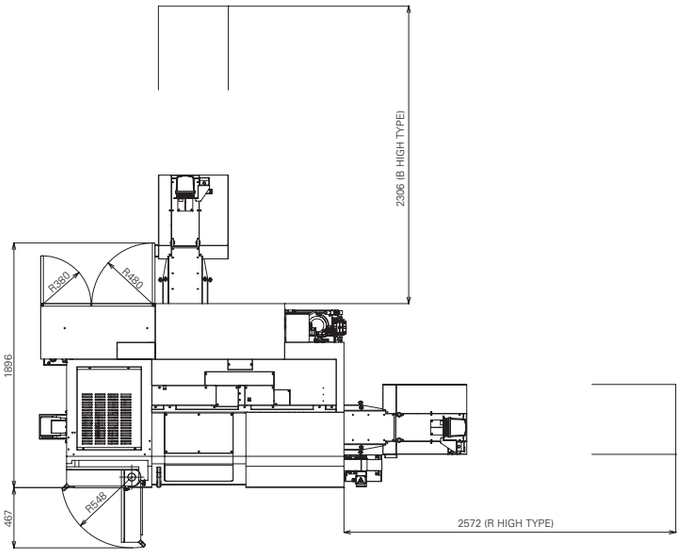

TURNING TOOL
EH73M000
HIGH FEED CUTOFF TOOL HOLDER R
EH73LO000
HIGH FEED CUTOFF TOOL HOLDER L
EH73H000
Cut off tool holder
□20×12
EH73G000
Turning holder R
□20
EH73A000
Turning holder S
□20
EH73J000
Turning & Plain holder R
□20 ϕ25
HD1
12 Station turret
CG73N000
Stopper plate S
6F787700
Pull out finger
Turning tool
CG73P000
O/H Double plain head A
ϕ25
CG73P020
CAP A
SUBSTANDARD
CL73B000
Fourth plain head
ϕ25
Collet holder
SSH25-ECH10-70
SSH25-ECH13-70
SSH25-ECH16-70
(ALPS TOOL)
Collet holder
CYD25×062/ ER16MF
(REGO)
Tapping collet
ET-1-16 Shank dia.:ϕ3~ϕ5.5 (M1~M5.5)
ET-1-20 Shank dia.:ϕ3~ϕ6.2 (M1~M8)
ET-1-25 Shank dia.:ϕ3~ϕ8.5 (M1~M12)
(SCHAUBLIN)
Chuck collet
AR16-D1 D=1~10
(ALPS TOOL)
Chuck collet
ER16-D1 D =1~10
(REGO)
Tap
Center drill
Straight shank drill
Straight shank reamer
Boring tool
Round hole bush
5W78 5000 (ϕ 8)
5W78 5100 (ϕ 10)
5W78 5200 (ϕ 12)
5W78 5300 (ϕ 16)
5W78 5400 (ϕ 20)
Drill holder
5E78 1400
Drill bush 20
2378 3600
Max. ϕ12
Straight drill
Center drill
REVOLVING TOOL
EH70A000
X Spindle unit
EH70B000
Z Spindle unit
Nut
Hi-Q/ ERAX20
(REGO)
Nut
NA20
(ALPS TOOL)
Nut
Hi-Q/ ERB20
(REGO)
Chuck collet
AR20-D1 D=1~13
(ALPS TOOL)
Chuck collet
ER20-D1 D=1~13
(REGO)
Tapping collet
ET-1-20
TAP SIZE : M3.5~M8
(SCHAUBLIN)
Tapp collet
AR20GB-M4~M8
(ALPS TOOL)
Straight shank drill
Center drill
End mill
Tap
CG70A000
X Spindle unit
(ALPS TOOL)
CG70J000
X Spindle unit
(LEE TECH)
CG70C000
Z Spindle unit
(ALPS TOOL)
CG70L000
Z Spindle unit
(LEE TECH)
Nut
NA16
(ALPS TOOL)
Nut
Hi-Q/ ERB16
(REGO)
Chuck collet
AR16-D1 D=1~10
(ALPS TOOL)
Chuck collet
ER16-D1 D=1~10
(REGO)
Tapping collet
ET-1-16
Tap size: M3.5~M6
(SCHAUBLIN)
Tapp collet
AR16GB-M4~M6
(ALPS TOOL)
CG70E000
Z Double spindle unit
(ALPS TOOL)
CG70N000
Z Double spindle unit
(LEE TECH)
CL70A000
X Double spindle unit
(ALPS TOOL)
CL70C000
X Double spindle unit
(LEE TECH)
CL70B000
Z Fourth plain head
(ALPS TOOL)
CL70D000
Z Fourth plain head
(LEE TECH)
Nut
NA11
(ALPS TOOL)
Nut
Hi-Q/ ERB11
(REGO)
Chuck collet
AR11-D1 D=1~7
(ALPS TOOL)
Chuck collet
AR11-D1 D=1~7
(REGO)
Tapping collet
ET-1-12
Tap size: M1~M3
(SCHAUBLIN)

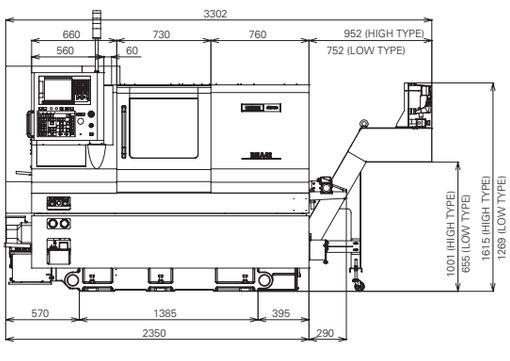
External view

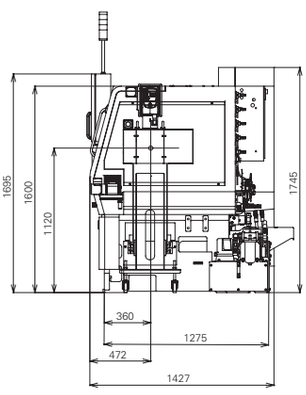
BNA42SY

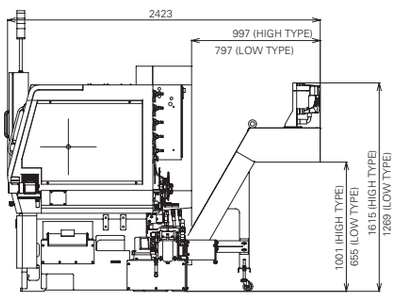




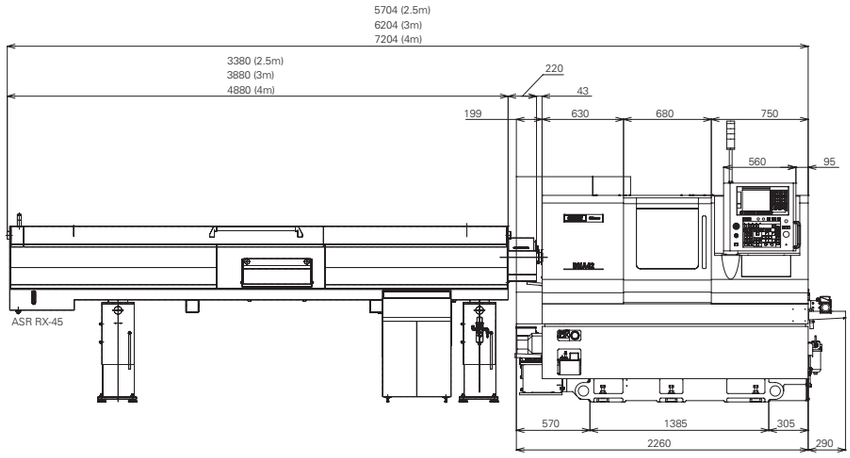


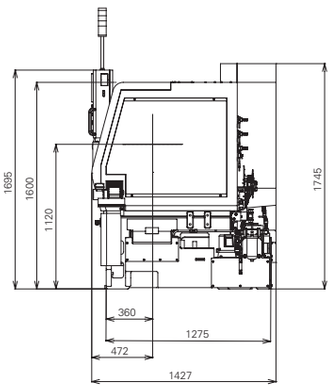


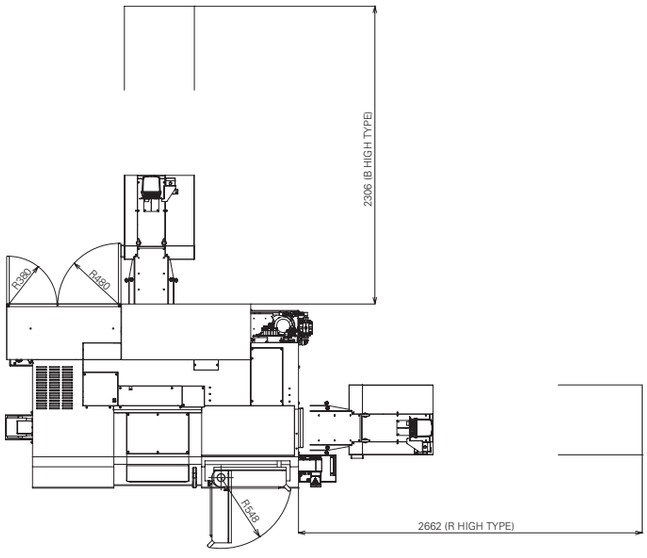


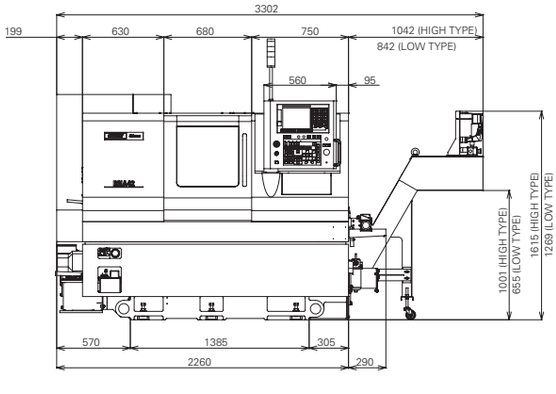


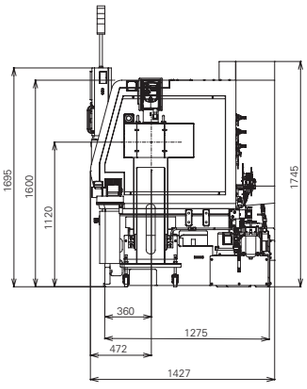
BNA42CY

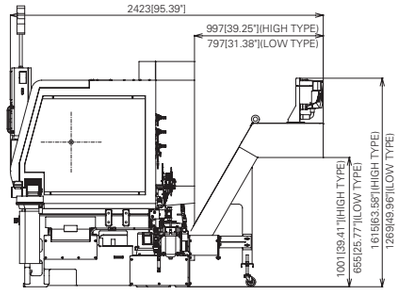

5704 (2.5m)
6204 (3m)
7204 (4m)
3380 (2.5m)
3880 (3m)
4880 (4m)
220
43
199
630
680
750
560
95
ASR RX-45
570
1385
305
2260
290


1695
1600
1120
1745
360
1275
472
1427


2306 (B HIGH TYPE)
R390
R480
R648
2662 (R HIGH TYPE)


3302
199
630
680
750
1042 (HIGH TYPE)
842 (LOW TYPE)
560
95
1001 (HIGH TYPE)
655 (LOW TYPE)
1615 (HIGH TYPE)
1269 (LOW TYPE)
570
1385
305
2260
290


1695
1600
1120
1745
360
1275
472
1427


2423[95.39"]
997[39.25"](HIGH TYPE)
797[31.38"](LOW TYPE)
1001[39.41"](HIGH TYPE)
655[25.77"](LOW TYPE)
1615[63.58"](HIGH TYPE)
1269[49.96"](LOW TYPE)

Machine Specification

Item		BNA-42CY5	BNA-42SY5
Capabilities/Capacities			
Max. machining length		200 mm	100 mm
Standard machining diameter	SP1	SP1	
	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		1	2
Spindle speed	SP1	60 to 6,000 min^{-1}	
	SP2		50 to 5,000 min
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" and 6" hollow chucks	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	(Limited to spiral and point taps for M8 x 1.25)	
		Max. M8 x 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 (at0.45 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		16 kVA	26 kVA
Air pressure source		0.5 MPa	
Fuse capacity on facilities side		75 A	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 2,260 x D 1,433 mm	W 2,350 x D 1,433 mm
Machine weight		3,220 kg	3,650 kg

NC specifications

	BNA-42CY5	BNA-42SY5
Control unit	FS.0i-TF PLUS	
Control axis		
HD1	X1, Z1, Y1, C1, E1 (Turret)	X1,Z1,Y1,B1, C1, C2, E1
	A1 (Rotary tools)	(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	X, Z1, Y1	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, x10	
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	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	512 Kbyte	1 Mbyte (Two system total)
Number of registered programs	400	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" colour 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 synchronisation 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)		

Citizen Machinery UK Ltd

1 Park Avenue, Bushey WD23 2DA, UK
Hurst Business Park, Narrowboat Way, Brierley Hill DY5 1UF, UK
Tel. +44 (0) 1923 691500 | sales@citizenmachinery.co.uk

www.citizenmachinery.co.uk

ASIA
Headquarter Japan | Citizen Machinery Co., Ltd., 4107-6 Miyota, Miyota-machi, Kitasaku-gun, Nagano-ken, 389-0206, Japan, Tel. +81-267 325 901
EUROPE
Headquarter Europe | Germany | Mettinger Straße 11, 73728 Esslingen, Tel. +49-711 3906 100 | France | Citizen Machinery France S.A.S., ZAE des Lacs 3, 1385 Avenue du Mole, 74130 AYSE, France, Tel. + 33-450 985 269 | Italy | Citizen Macchine Italia s.r.l., Via Campo Romano 11/13 – 24050 Spirano (BG), Italy, Tel. +39-035 877 738 | Spain | Egasca, S.A., Polígono Industrial Erisono 2, 20600 Eibar, Gipuzkoa, Spain, Tel. +34-943 200 300 | UK | Citizen Machinery UK Ltd., 1 Park Avenue, Bushey, WD23 2DA, UK, Tel. +44-1923 691 500