CITIZEN

Cincom

L20

Sliding Headstock Type Automatic CNC Lathe

LASER CUTTING

ATC
AUTOMATIC TOOL CHANGING

EcoBalance Machine

LFV technology

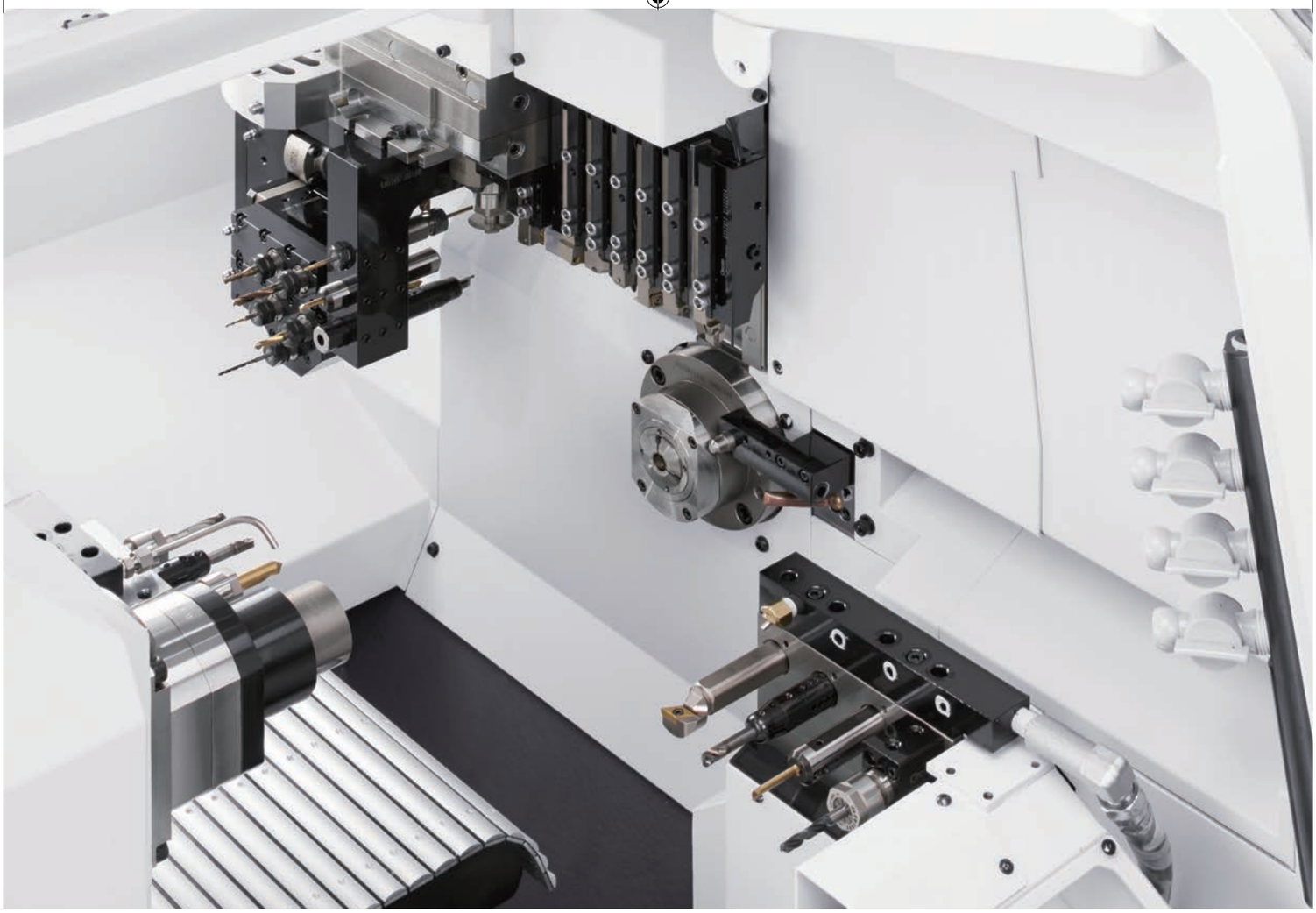

CITIZEN
Cincom
L20XII
LFV
Technology

Full Model Change for the Cincom L20 Basic performance and operability have been greatly improved and the machine has evolved to become environmentally friendly

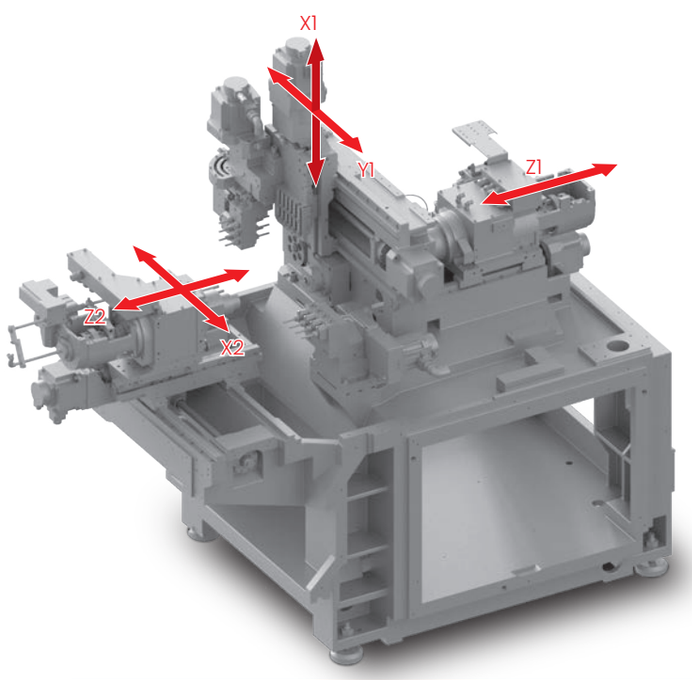
The new L20 helps reduce downtime by enabling the use of Citizen's proprietary LFV (low-frequency vibration cutting) technology for both front and back machining.
In addition, the improved acceleration/deceleration due to the higher output of the back spindle helps to shorten cycle times. Tool shortages have been eliminated by increasing the maximum number of turning tools that can be mounted on the gang tool post to six.
The high-end model L20XIIB5 supports simultaneous 5-axis control and can perform complex machining in conjunction with a CAM system.
As for operation, the large touch panel screen greatly improves ease of use.
From the view point of environmental protection, the L20 has evolved toward sustainable manufacturing with its improved environmental performance that supports our efforts to reduce CO2 emissions, including reducing air consumption through optimal air control and visualisation of environmental information.

L20

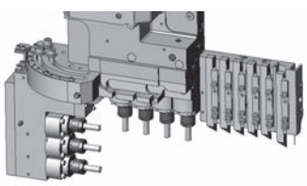
We work to continuously enhance corporate value through “sustainable management” that takes into account social issues such as human rights and the global environment throughout the value chain, while at the same time promoting the provision of “sustainable products” such as our proprietary technologies, which include LFV (low-frequency vibration cutting) technology.



VIII



Gang tool post

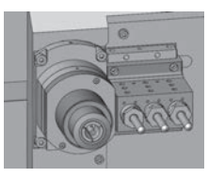


U31B
4 rotary tools

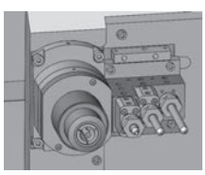
GSE3310
3 rotary tools

GTF7812
6 tools

Opposite tool post

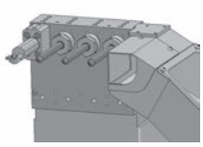


U120B
Front 3-spindle holder
3 fixed tools

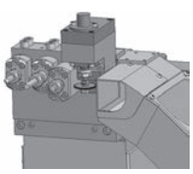


U121B
Front 3-spindle holder
3 fixed tools
2 tools for deep holes

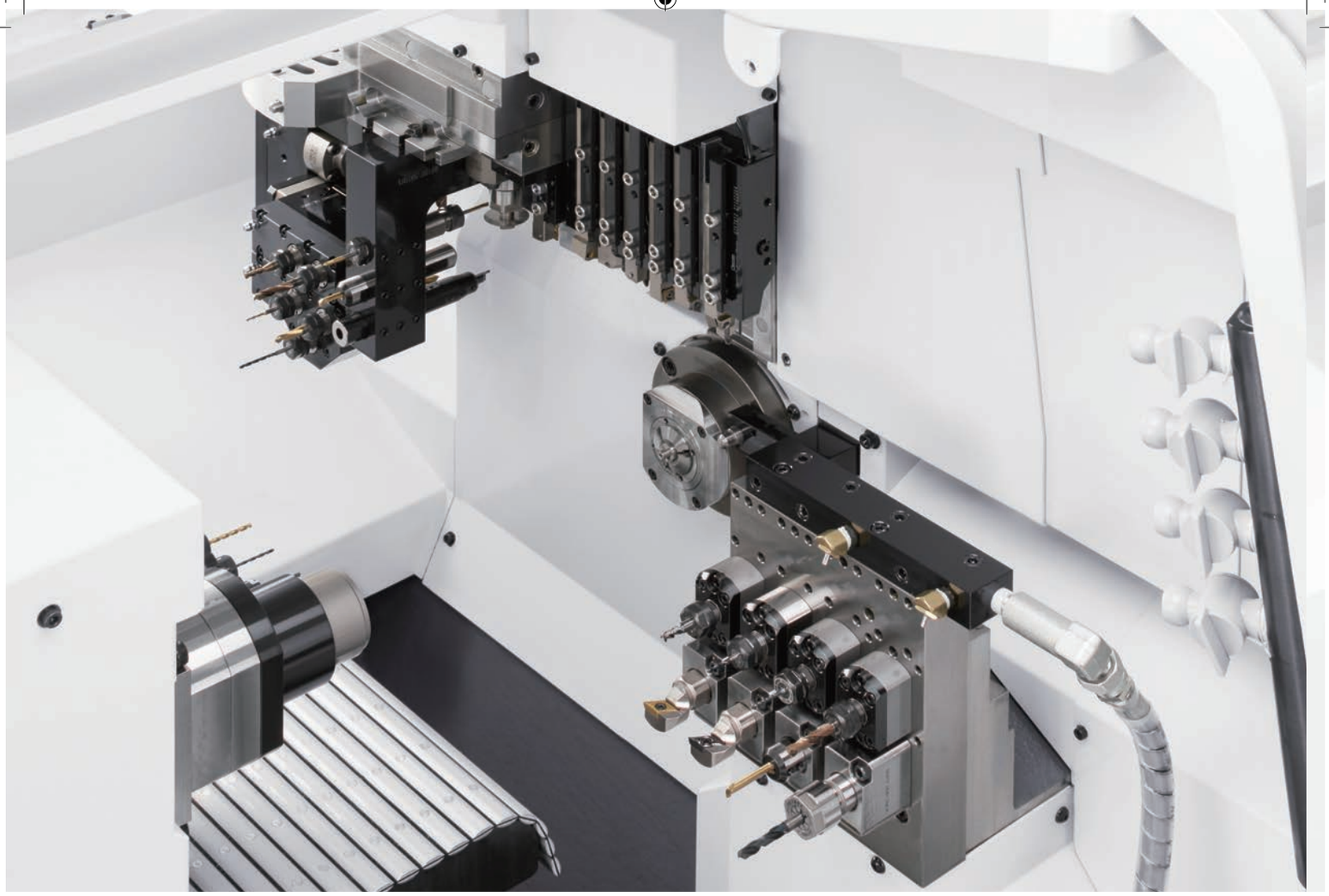
Back tool post



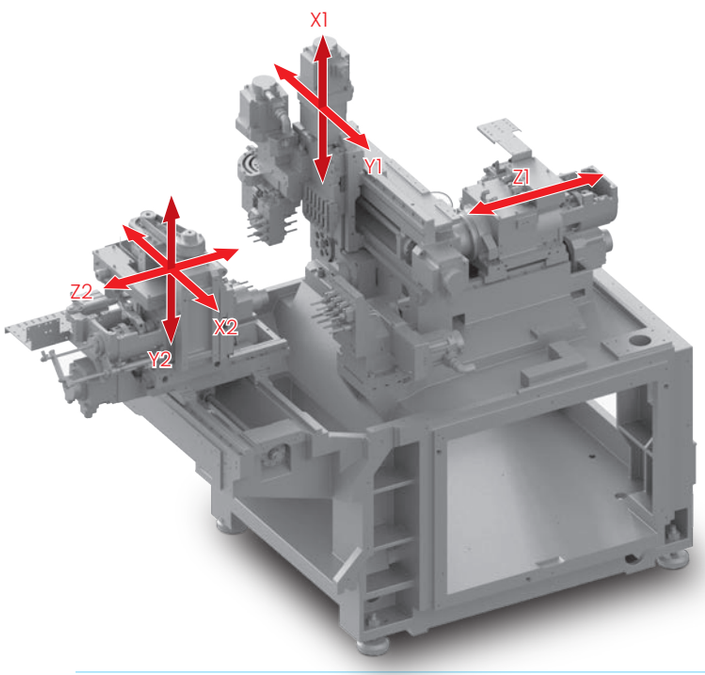
U150B
Back 4-spindle holder
4 fixed tools



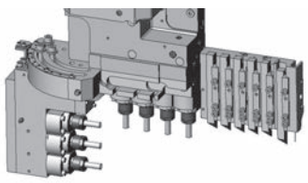
U151B
Back rotary tool drive device
4 rotary tools



X



Gang tool post

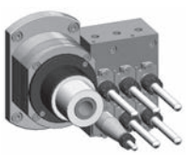


U31B
4 rotary tools

GSE3310
3 rotary tools

GTF7812
6 tools

Opposite tool post

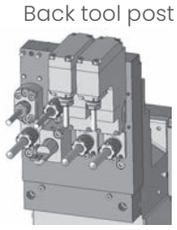


U125B
Front 6-spindle holder
6 fixed tools

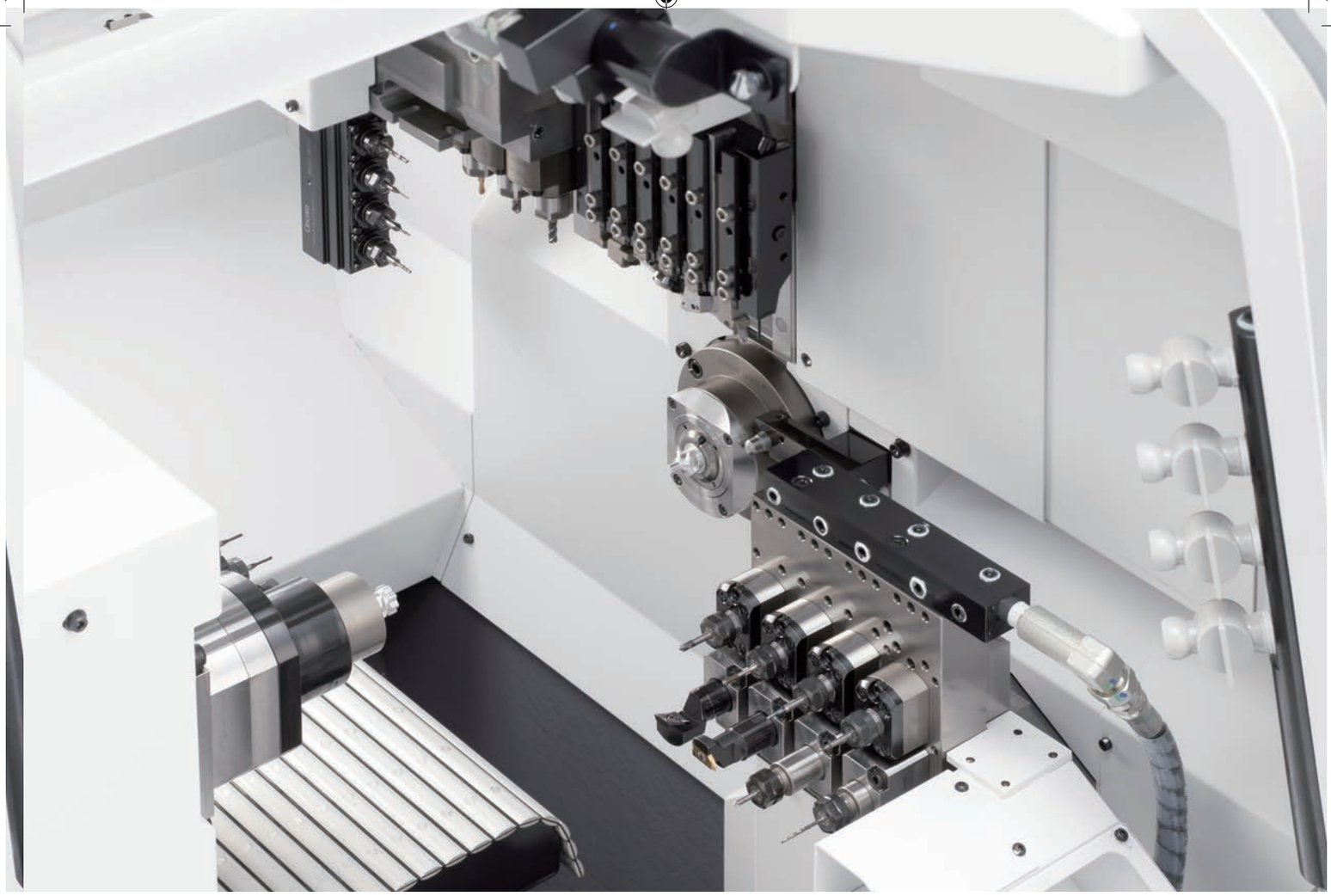
U126B
Front 6-spindle holder
6 fixed tools
3 for deep holes

U127B
Front rotary tool drive device
3 rotary tools
3 fixed tools

Back tool post

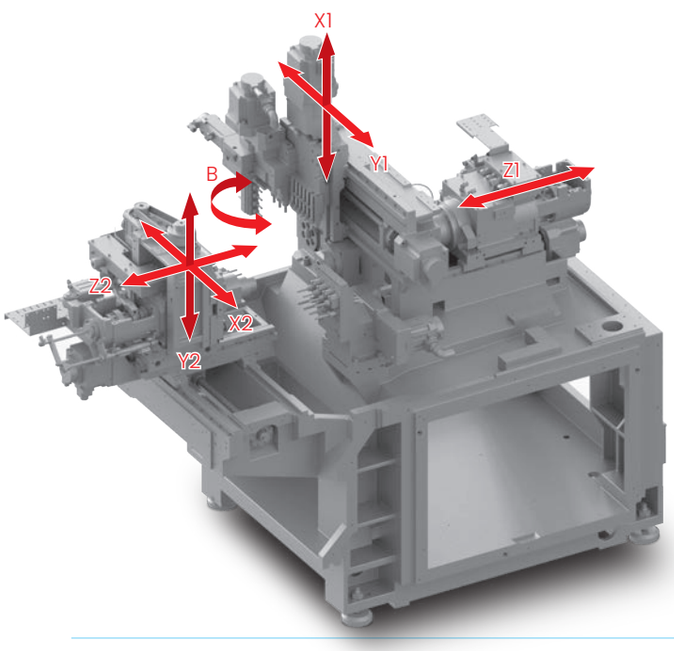


U152B
Back rotary tool drive device
4 rotary tools
4 fixed tools

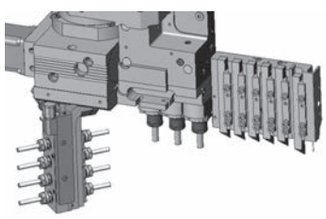


XII
XIIB5

Simultaneous 5-axis control



Gang tool post

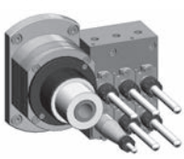


U32B
3 rotary tools

MEU507
8 rotary tools

GTF7812
6 tools

Opposite tool post

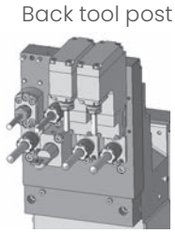


U125B
Front 6-spindle holder
6 fixed tools

U126B
Front 6-spindle holder
6 fixed tools
3 for deep holes

U127B
Front rotary tool drive device
3 rotary tools
3 fixed tools

Back tool post



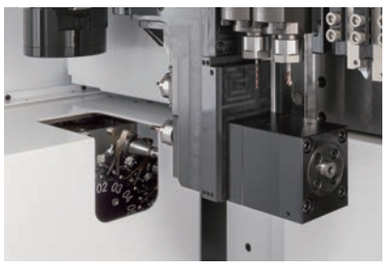
U152B
Back rotary tool drive device
4 rotary tools
4 fixed tools

ATC (Automatic Tool Changer)

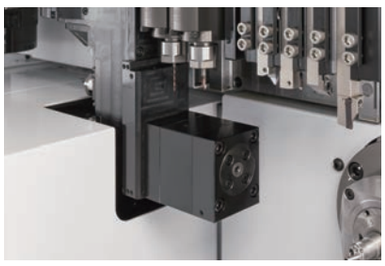
Citizen's unique, compactly designed B-axis ATC tooling can be mounted on the gang tool post to enable use of a total of 13 B-axis tools, comprising 12 ATC tools for front machining and one tool built into the tooling.

- In addition to the capability for machining complex parts like medical parts, the ATC unit/tooling provides an environment where the tool setting for machining several types of workpieces can be completed in a single setup.
- In addition to B-axis machining, the ATC tooling can also be used in a wide range of applications such as those with cross machining/end face hole machining and slitting/hobbing, utilizing a wealth of tool variations.
- A 2.2 kW motor is used for the gang tool spindle. This gives rotary tools high torque and high speed performance.

During cutting using the B axis



Magazine



During B-axis tool change

ATC tools

Tool presetter

Specifications

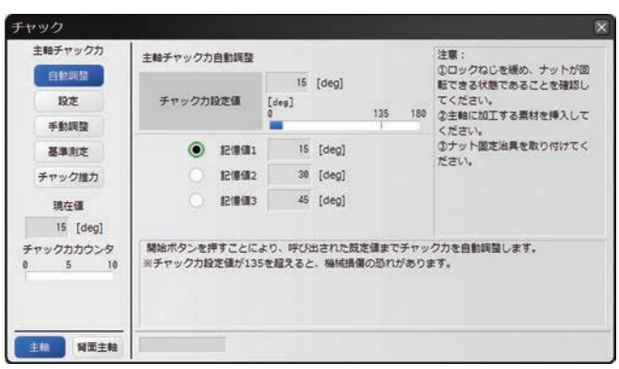
ATC tooling max. spindle speed	12,000 min^{-1}	Total number of tools mountable on machine	35 tools max. (B-axis tools included)
Motor output	2.2 kW	Tool change time (chip-to-chip)	4 sec
Tool holder type	JBS-15T	Max. tool outer diameter	dia. 30 mm
Number of B-axis tools	12 (magazine) + 1 (built-in)	Max. tool gripping diameter	dia. 10 mm (ER16)

Improved access to the machining chamber

The front door can now be fully opened, and a door is provided on the back of the machine to improve working convenience inside the machining chamber.
In addition, the units inside the chamber have been made as compact as possible and the coolant nozzles have been arranged so that the machining chamber is bright and open, improving working convenience during setup changes and other operations.

Automatic chucking force adjustment function

The angle of the chucking force adjustment nut of the spindle or back spindle can be saved after adjusting the chucking force.Anyone can easily reproduce the chucking force by calling the saved value.



Chucking force monitoring function (Servo-driven chucking device)

This function makes it possible to monitor variations in chucking force during continuous operation, and to stop operation or give a warning message according to the load conditions.

Better Operability

The latest Windows-based NC unit is equipped.The 15-inch touch panel screen has high visibility and has been designed for intuitive operation.

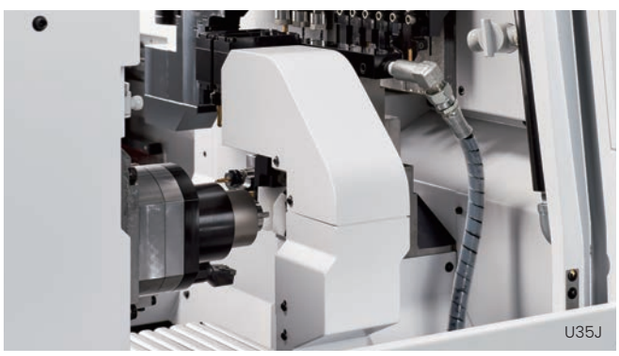
Number of tools on the gang tool post increased

Tool shortages have been eliminated by increasing the maximum number of turning tools that can be mounted on the gang tool post to six.

Higher output for the back spindle motor

The higher output of the back spindle improves acceleration/deceleration, which helps to shorten cycle times.In addition, the maximum spindle speed has been increased to 10,000 min^{-1}.

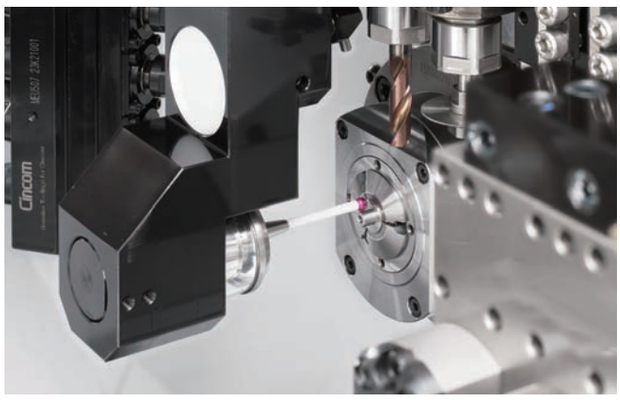
Flexible support for formed material



By using the loader, formed material can be supplied to the spindle (an external loader is required separately). High efficiency is achieved by supplying unmachined workpieces inside the spindle room while machining is being performed on the back spindle.The unloader can also be used to unload products from the machine.

Automatic in-machine measurement

Supports the stable production of workpieces by using the measurement results to determine whether workpieces are defective or not so that defective products can be excluded by correcting the workpiece coordinate system or stopping operation in an alarm status.



Reduction of CO2 emissions and visualisation of power consumption

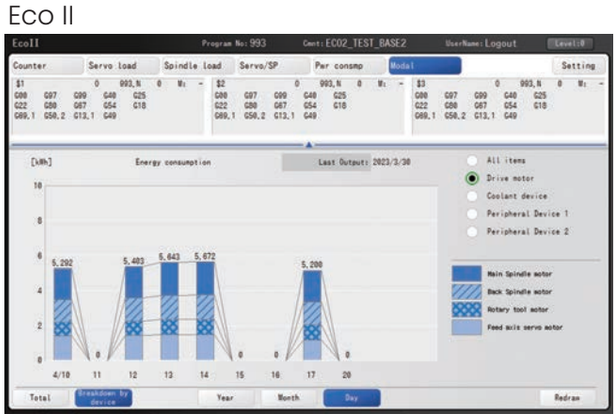
"Eco II", which supports customers' efforts to save power, provides visibility into the power consumption, CO2 emissions, and reduction effects for each function.It facilitates efforts to reduce power consumption.

The machine is equipped with an air blow intermittent discharge function that reduces air consumption by about 60% while maintaining the effect and capacity of air blow, and an air purge control function that shuts off air purging when the preset time has elapsed, greatly reducing air consumption while the machine is on standby.

The idling stop function is used to stop unnecessary machine operation in the standby status where no programmed operation is in progress, thereby reducing power consumption.

The servo motor idling stop function judges, based on the machine operation status, whether the excitation of servo motors can be turned off, and turns it off when axis travel is not required.

Eco II



LFV Technology (optional)

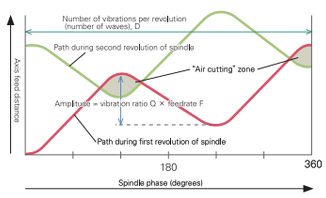
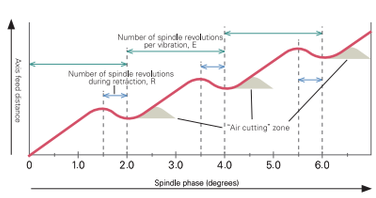
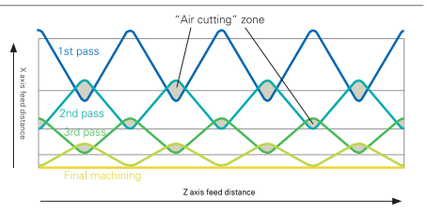
Vibration mode

Chips generated by conventional cutting

Chips with LFV

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 lessens the 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	LFV mode 2	LFV mode 3
Operation	Multiple vibrations per spindle revolution	Multiple spindle revolutions per vibration	Vibration threading
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.	A vibrating behavior is applied in the direction of the cutting (notching) during threading with the timing of this vibration changing with each pass in relation to the rotary phase of the spindle to provide "air-cutting" during the machining and break up chips.
Application	Ideal for outer/inner diameter machining and groove machining	Ideal for micro-drilling, where peripheral speed is required	Optimal for threading of internal and external diameters
Waveform			

Note 1: LFV machining can be performed with the X1, Z1, X3, Z3 axis.
Note 2: LFV machining can be performed simultaneously on a maximum of 1 pair of axes.
Note 3: For LFV machining with rotary tools, the "LFV function" and "rotary tool feed per revolution" options are required.

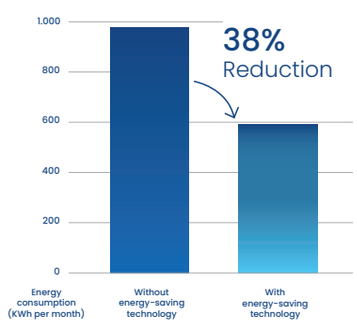
Eco-Balance

Citizen is actively committed to reducing energy consumption and waste. Modern technologies such as full servo, idle stop technologies and intelligent air control units, as well as the use of renewable energies, conserve valuable resources and reduce CO_2 emissions - without compromising on the machining accuracy or service life of the machines.

Full servo technology

The innovative servo technology replaces hydraulic components, reduces energy consumption and improves the production environment. This contributes to more sustainable production and CO_2 reduction. (Available on Cincom Machine)

Effects of full servo & idling stop technologies

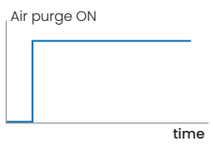


Calculation conditions: Calculated on the basis of 13 hours of operation per day for 25 days per month, with a machine operation rate of 79 %.

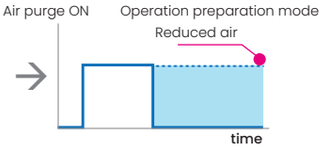
Idling stop technology

The idle stop technology reduces energy consumption, by automatically switching off unneeded components such as servos, fans and lighting as soon as the machine is at a standstill.

Air purge always ON



Air purge OFF when not in operation



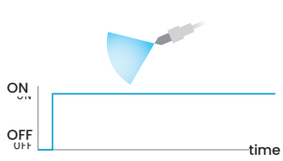
Optimised air control

Our technology optimises air consumption during spindle rinsing and blast air delivery without compromising machining accuracy. The air flushing is precisely adapted to the coolant requirement, while blast air is only used when it is actually needed.

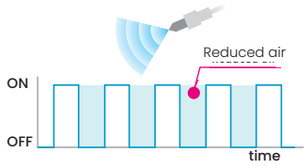
Reduction of the cycle time

Citizen Control technology shortens cycle times and reduces power consumption at the same time. This significantly improves the carbon footprint through more efficient machine operation and shorter cycles.

Continuous air pressure

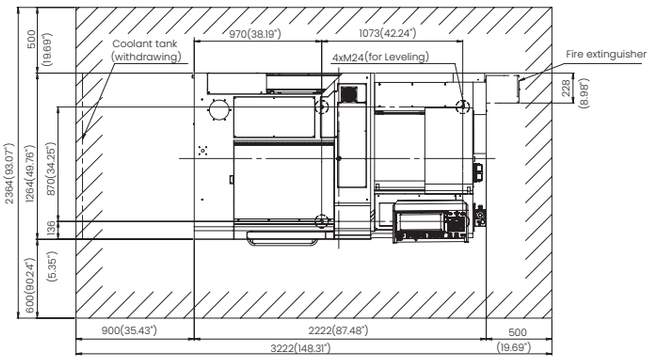


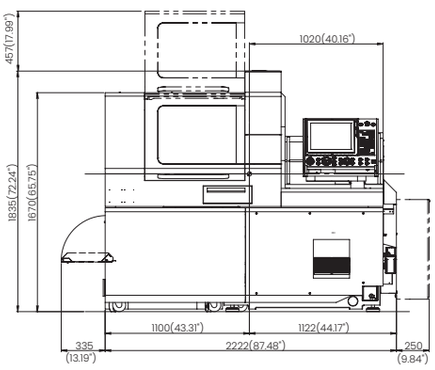
Pulsating air pressure



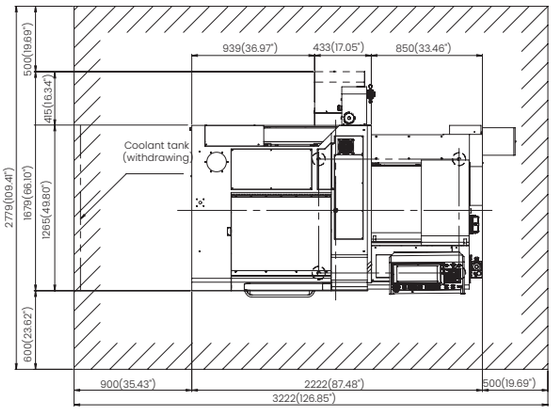
External view

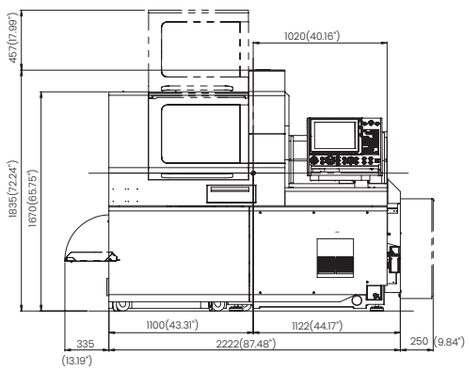
Standard specification machine



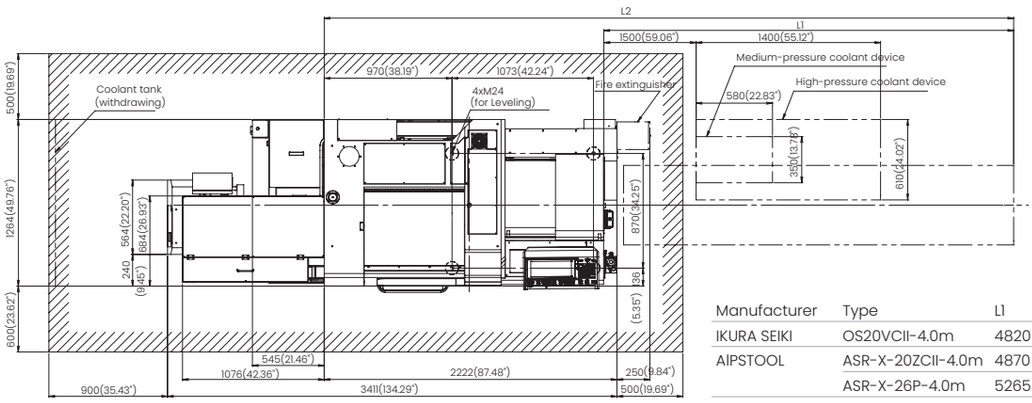


ATC Specifications

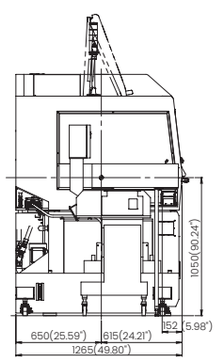


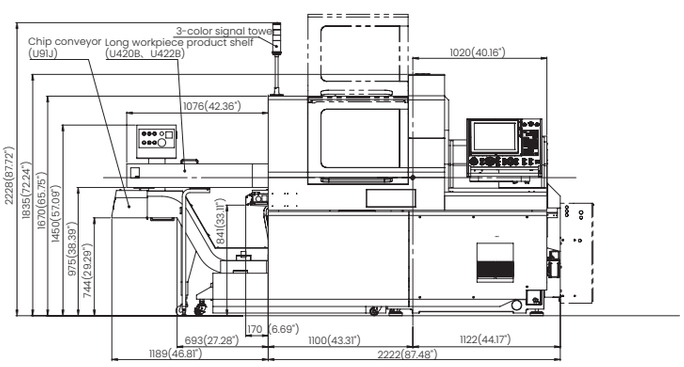


Machine equipped with options



Manufacturer	Type	L1	L2
IKURA SEIKI	OS20VCII-4.0m	4820	6940
AIPSTOOL	ASR-X-20ZCII-4.0m	4870	6990
	ASR-X-26P-4.0m	5265	7385





Machine specifications

Item	L20E - 3M8	L20E - 3M9	L20E - 3M10	L20E - 3M12	L20E - 3M12B5
Max. machining diameter (D)	dia.20 mm, dia.25 mm [1"] option				
Max. machining length GB dia.20mm spec.	200 mm per chucking				
dia.25mm spec. GBL	188 mm per chucking Max. 50 mm per chucking				
Max. front drilling diameter	10 mm dia.				
Max. front tapping diameter	M8 (cutting tap)				
Spindle through-hole diameter	26.4 mm dia.				
Spindle rotation	Max.10,000 min^{-1}				
Max. chuck diameter for the back spindle	dia.20 mm, dia25 mm [1"] option				
Max. taking-out length of the workpiece	130 mm				
Max. workpiece protrusion length of back spindle	40 mm				
Back machining max. drilling diameter	8 mm dia.				
Back machining max. tapping diameter	M8 (cutting tap)				
Back spindle speed	Max. 10,000 min^{-1}				
Gang tool post rotary tool					
Max. drilling diameter	8 mm dia.				
Max. tapping diameter	M6 (cutting tap)				
Spindle rotation	Max. 6,000min^{-1} (rated speed: 4,500min^{-1})				
	S3 high-power motor specifications: Max. 9,000 min^{-1}(rated speed: 9,000 $^{-1}$)				
Rotary tools on the opposite tool post	Max. 6,000min^{-1} (rated speed: 4,500min^{-1})				
Max. drilling diameter	-	-	dia. 5 mm		
Max. tapping diameter	-	-	M4 (cutting tap)		
Spindle rotation	-	-	Max. 7,500 min^{-1} (rated speed: 6,000min^{-1})		
Back rotary tool*1					
Max. drilling diameter	option		dia. 5 mm		
Max. tapping diameter	option		M4 (cutting tap)		
Spindle rotation	option		Max. 7,500 min^{-1} (rated speed:6,000min^{-1})		
Max. number of mountable tools	38	34	45	41	
Turning tools on the gang tool post	6				
Rotary tools on the gang tool post	25	21	25	21	
Front drilling tool	3		6		
Back drilling tool	4		8		
Tool size					
Turning tool	sq. 12 mm (sq. 13 mm, sq. 16 mm)				
Sleeve	dia. 25mm (GDS107, 210), dia.19.05 mm				
Chuck / bushing					
Front spindle collet chuck	FC034-M, FC071-M (ø25 mm [1"])				
Back spindle collet chuck	FC034-M-K, FC071-M-K(ø25 mm [1"])				
Rotary tool collet chuck	ER11, ER16				
Guide bushing	WFG206-M, DFG206-M, FG521-M(dia. 25 mm [1"])				
Rapid feed rate					
X1, Y1, Z1, X2, Z2 axis	32 m/ min				
Y2 axis	-	-	8 m/ min		
Motors					
for front spindle drive	2.2/ 3.7/ 5.5 kW (continuous/15 min/10%ED				
for back spindle drive	1.5/ 2.2/ 3.7 kW (continuous/ 40%ED/ 10%ED ratings)				
for driving rotary tools on the gang tool post	1.0 kW (2.2 kW with S3 high-power motor specifications)				
for front rotary tool drive	0.75 kW				
for back rotary tool drive	0.75 kW				
For coolant	0.4 kW				
Rated power consumption*2	8.3 kVA				
Load operation average power consumption*3	4.5 kVA				
Total load current	37 A (41 A with S3 high-power motor specifications)				
Main breaker capacity	60 A				
Power supply voltage	AC 200V ± 10%				
Pneumatic device					
Required pressure	0.5 MPa				
Required flow rate	52/ 55/ 177 L/ min (Power ON/Normal/ With air blow)				
Machine dimensions	W 2,222 × D 1,265 × H 1,835 mm				
Centre height	1,050 mm				
Machine weight	2,630 kg		2,680 kg		

*1 Rotary tools on the back tool post are optional.
*2 The rated power consumption is the power consumption when the machine is in operation at full capacity.
*3 The load operation average power consumption is the standard power consumption during machine operation.The actual power consumption varies depending on the cutting conditions and other conditions.

Standard Accessories	
Spindle chucking device	Back spindle chucking device
Rotary tool spindle drive device of the gang tool post	Back rotary tool driving device (X, XII, XIIB5 only)
Rotary guide bushing drive unit	Cut-off tool breakage detector
Coolant tank (with level detector)	Central lubrication device (with level detector)
Air-driven knock-out device for back machining	Machine relocation detector
Spindle cooling device	Automatic fire extinguisher

Special Accessories	
Knock-out device for through-hole workpieces	Motor-driven knock-out device for back machining
Rotary guide bushing device	Long workpiece device
Product unloader	Workpiece conveyor
Chip conveyor	Medium-pressure coolant device
High-pressure coolant device	Coolant flow rate detector
3-colour signal tower	Servo-driven chucking device
Loader device	LFV
ATC unit	Extended coolant tank device
Automatic in-machine measurement	CITOolingSystem

Standard NC Functions	
CINCOM SYSTEM M850LUC-V Product of MITSUBISHI ELECTRIC: XIIB5	
CINCOM SYSTEM M820LUC-V Product of MITSUBISHI ELECTRIC: VIII, IX, X, XII	
15-inch XGA touch panel	Program storage capacity: 160 m (64kB)
Tool offset pairs: 99	Product counter: max. 8 digits
User disk space: 10 MB	Preparation functions
Operating time display	Machine operation information display
B-axis control function	Back machining program skip function
Interference check	Collision detection function
Spindle speed fluctuation detection function	Spindle constant surface speed control function
Automatic power-off function	Spindle 1° indexing function
On-machine program check function	Tool nose radius compensation function
Eco display	Corner chamfering/ Corner R
Multiple repetitive cycle for turning	USB slot and SD card slot
Automatic chucking force adjustment function	Chucking force monitoring function (servomotor type only)

Special Additional NC Functions	
Variable lead thread cutting	Circular thread cutting
3D chamfering function	Geometric command function
Spindle synchronous control function	Spindle C-axis function
Milling interpolation function	Back spindle 1° indexing function
Back spindle C-axis function	Back spindle chasing function
Canned drilling cycle	Synchronised tapping phase adjustment function
Synchronised tapping function	High-speed synchronised tapping function
Differential speed rotary tool function	Optional block skip: 9 sets
Tool life management I	Tool life management II
Program storage capacity: 1200 m (480 kB)	User disk space: 100 MB
External memory program operation	Sub-micron unit system command
User Macro	Helical interpolation function
Inclined helical interpolation function	Hobbing function
Polygon machining function	Inch specifications
Sub-inch specifications	alkarttransfer
RS-232C connector	Rotary tool feed per revolution
Tool monitoring function	

Environmental information

Approach to environmental issues	Recycling	Indication of the material names of plastic parts	Covered in the instruction manual
	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.

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