CITIZEN

Cincom

L20

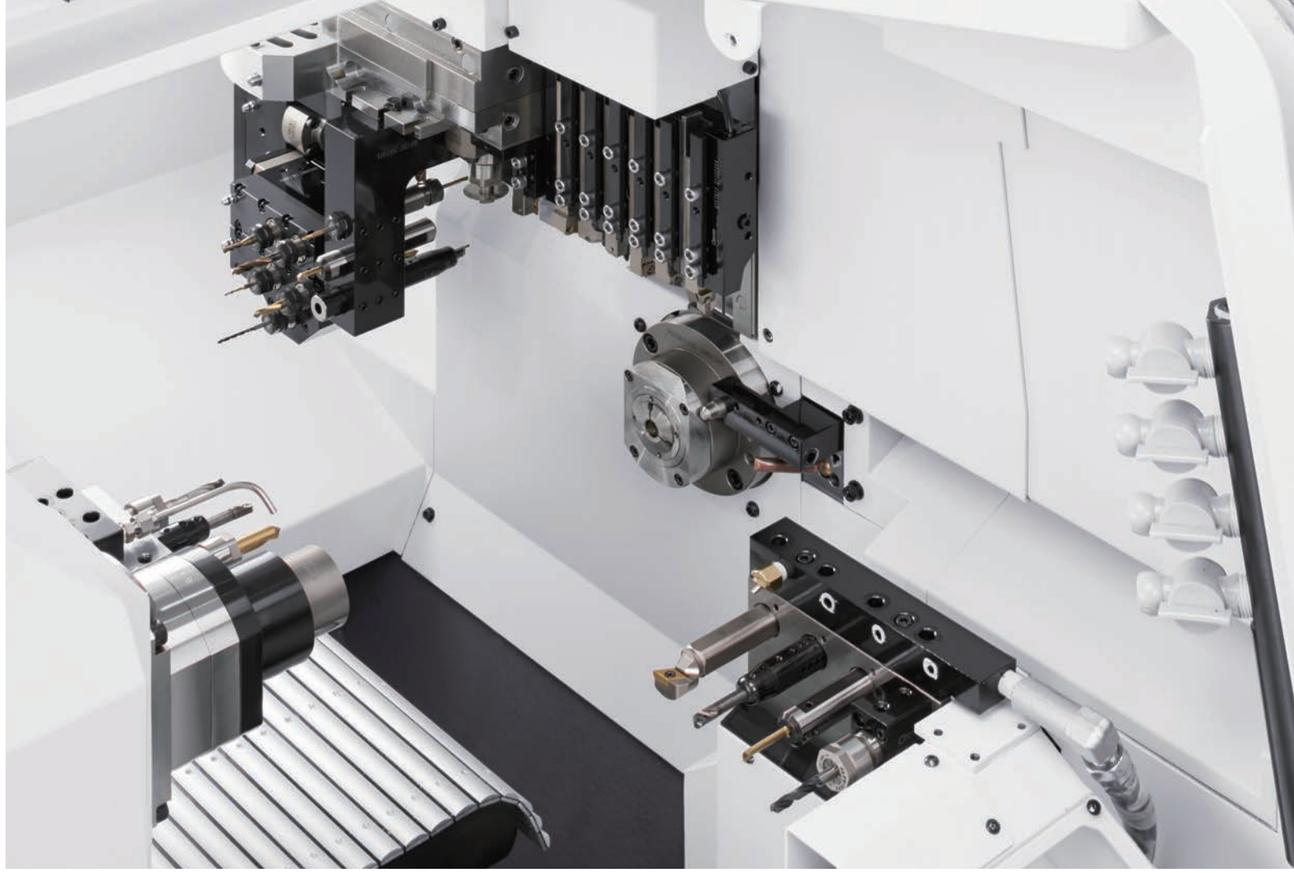
Sliding Headstock Type Automatic CNC Lathe

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

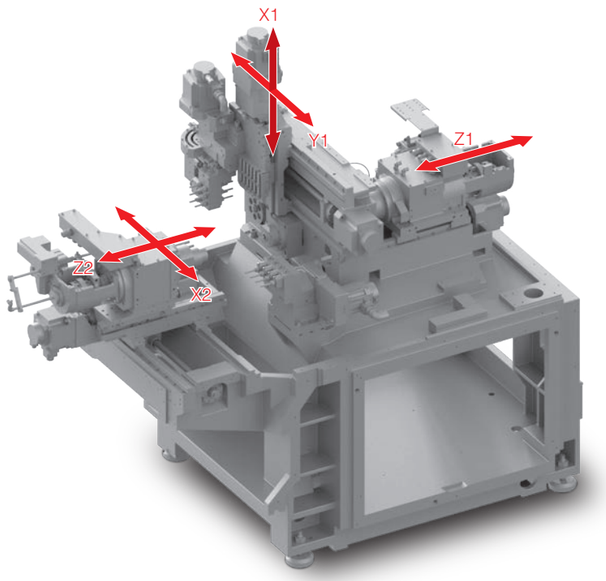
The new L20 helps reduce downtime by enabling the use of Citizen's proprietary LFV (low-frequency vibration cutting) technology for both front and back machining.
In addition, the improved acceleration/deceleration due to the higher output of the back spindle helps to shorten cycle times.Tool shortages 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

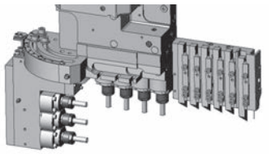
We work to continuously enhance corporate value through “sustainable management” that takes into account social issues such as human rights and the global environment throughout the value chain, while at the same time promoting the provision of “sustainable products” such as our proprietary technologies,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



VIII



Gang tool post

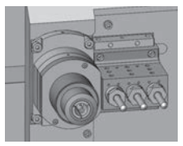


U31B
4 rotary tools

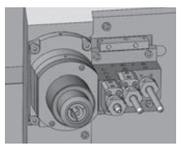
GSE3310
3 rotary tools

GTF7812
6 tools

Opposite tool post

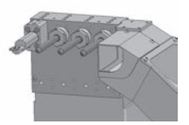


U120B
Front 3-spindle holder
3 fixed tools

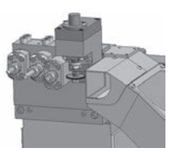


U121B
Front 3-spindle holder
3 fixed tools
2 tools for deep holes

Back tool post



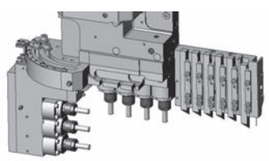
U150B
Back 4-spindle holder
4 fixed tools



U151B
Back rotary tool drive device
4 rotary tools

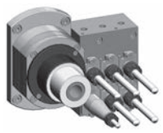
X

Gang tool post



U31B
4 rotary tools
GSE3310
3 rotary tools
GTF7812
6 tools

Opposite tool post

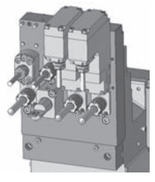


U125B
Front 6-spindle holder
6 fixed tools

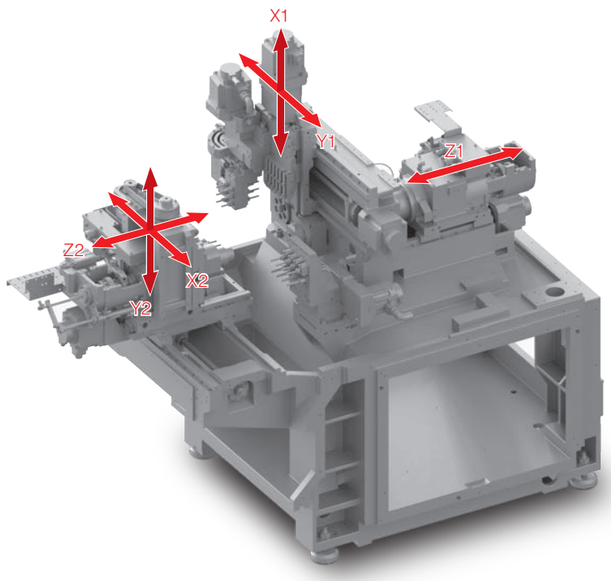
U126B
Front 6-spindle holder
6 fixed tools
3 for deep holes

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

Back tool post

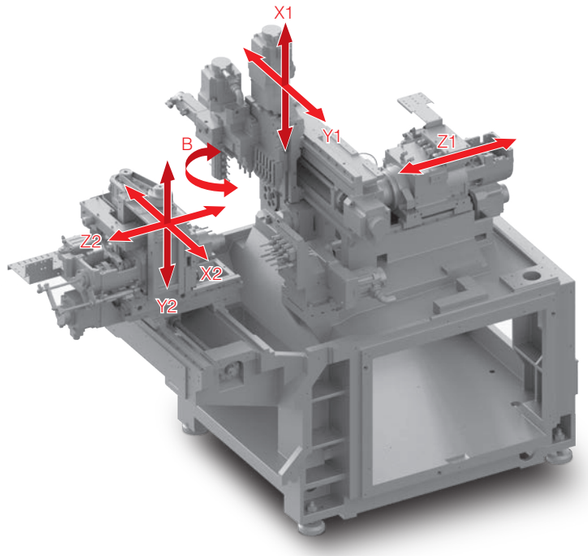


U152B
Back rotary tool drive device
4 rotary tools
4 fixed tools

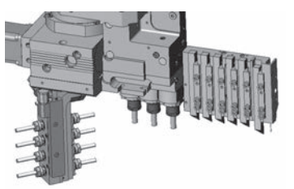


XII
XIIB5

Simultaneous 5-axis control

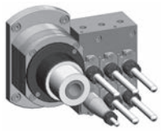


Gang tool post

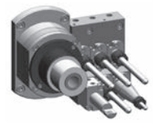


U32B
3 rotary tools
MEU507
8 rotary tools
GTF7812
6 tools

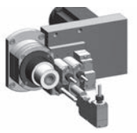
Opposite tool post



U125B
Front 6-spindle holder
6 fixed tools

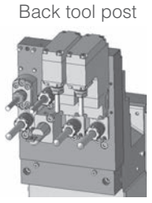


U126B
Front 6-spindle holder
6 fixed tools
3 for deep holes



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

Back tool post



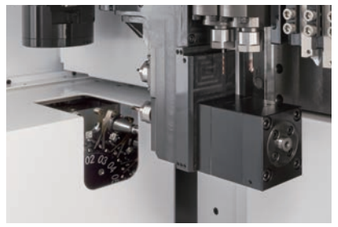
U152B
Back rotary tool drive device
4 rotary tools
4 fixed tools

ATC (Automatic Tool Changer)

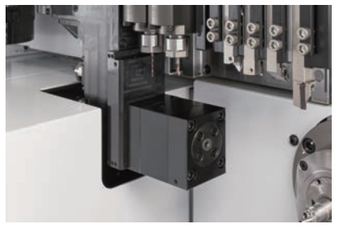
Citizen's unique, compactly designed B-axis ATC tooling can be mounted on the gang tool post to enable use of a total of 13 B-axis tools, comprising 12 ATC tools for front machining and one tool built into the tooling.

- 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

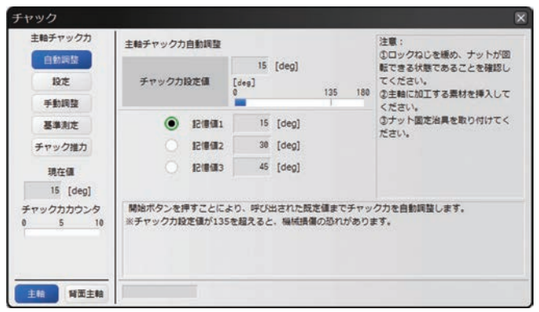
ATC tooling max. spindle speed	12,000 min^{-1}	Total number of tools mountable on machine	35 tools max. (B-axis tools included)
Motor output	2.2 kW	Tool change time (chip-to-chip)	4 sec
Tool holder type	JBS-15T	Max. tool outer diameter	dia. 30 mm
Number of B-axis tools	12 (magazine) + 1 (built-in)	Max.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

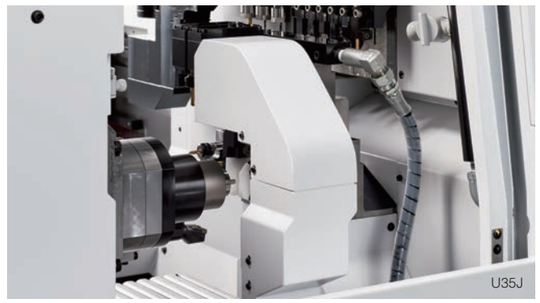
Number of tools on the gang tool post increased

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}.

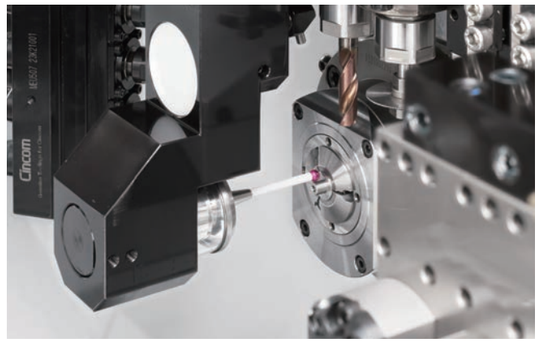
Flexible support for formed material



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 visualization 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

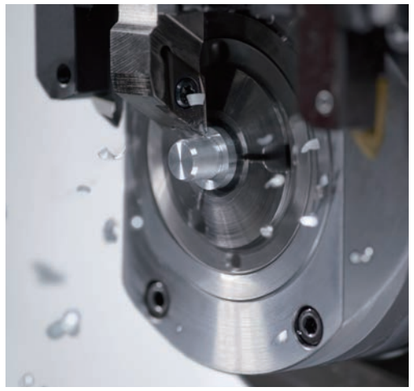
LFV (low-frequency vibration cutting) technology

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

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.
Back LFV machining is now available on all models.

Chips generated by conventional cutting

Chips with LFV



LFV mode 1

When you want to thoroughly break up chips

Method where the number of vibrations per revolution of the workpiece is specified

CG Videos

Machining Videos

LFV mode 2

When a surface speed is required, such as when machining thin workpieces or small-diameter deep holes

Method where the amount of workpiece rotation per vibration is specified

CG Videos

Machining Videos

LFV mode 3

When you want to break up chips in thread cutting

Method where machining is performed while changing the vibration timing every thread cutting pass

CG Videos

Machining Videos

Note 1 LFV machining is supported on the Z1, X1, X2 and Z2 axes. Note 2 LFV machining cannot be performed with the Y axis.
Note 3 For LFV machining with rotary tools, the "LFV function" and "rotary tool feed per revolution" options are required.

CIToolingSystem

CIToolingSystem

CITIZEN Machinery's Quick Tool Change System "CIToolingSystem"
Speed up tool changes without using wedges or bolts.
The tool layout remains the same, reducing the time spent on setups, ensuring tool nose position repeatability, and improving rigidity during machining.

Time Shortened

With its unique coupling structure, the quick tool change function is achieved by only half-turning the wrench when removing or mounting a tool.
The tool change time is reduced by approximately 80% for reliable tool changes.

Repeatability

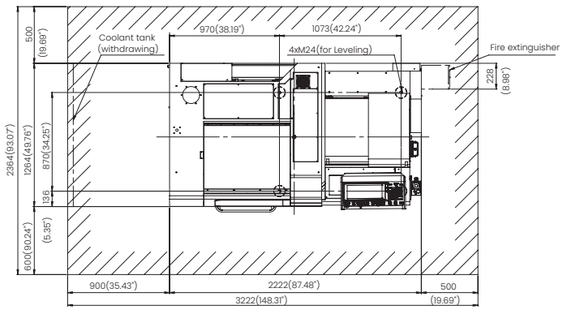
The two-face-constraint clamp unit with a polygon taper shank delivers a strong clamping force.
When mounting and dismounting, a high repeatability of ±2 μm is achieved in the radial, center, and longitudinal directions.

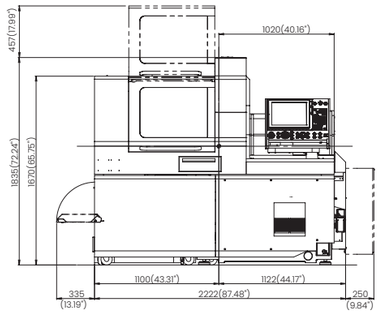
High Rigidity

The same size as a 12 x 12 tool holder, but high rigidity is assured.
This reduces chattering at high loads, prolongs tool life, and stabilizes workpiece quality.

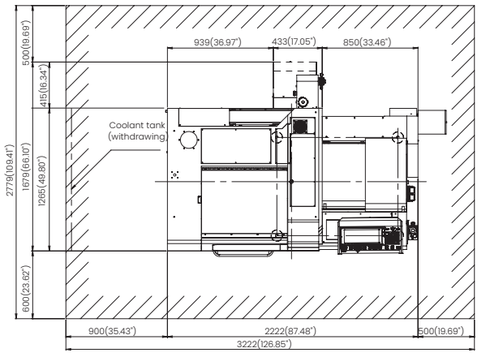
External view

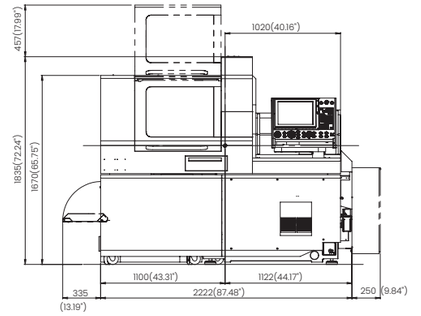
Standard specification machine



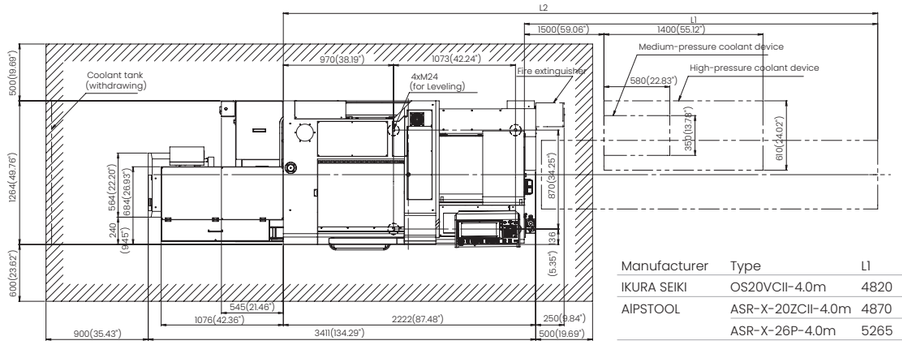


ATC Specifications

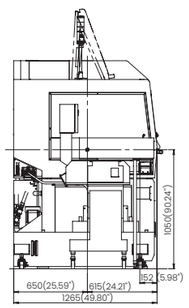


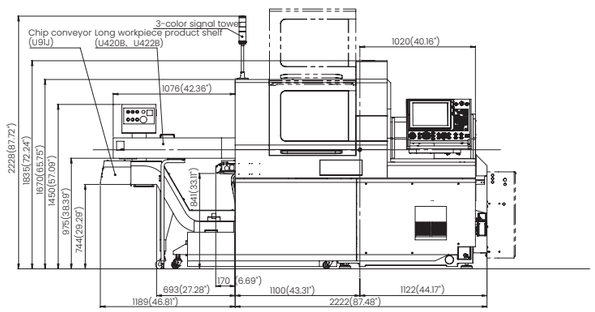


Machine equipped with options



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		L20				
		VIII	IX	X	XII	XIIB5
		L20E - 3M8	L20E - 3M9	L20E - 3M10	L20E - 3M12	L20E - 3M12B5
Max. machining diameter		dia.20 mm, dia.25 mm [1"] option				
Max. machining length	GB dia.20mm spec.	200 mm per chucking				
	dia.25mm spec.	188 mm per chucking				
	GBL	Max. 50 mm per chucking				
Max. front drilling diameter		dia. 10 mm				
Max. front tapping diamete		M8 (cutting tap)				
Spindle through-hole diameter		dia. 26.4 mm				
Spindle rotation		Max.10,000 min^{-1}				
Max. chucking diameter of 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		dia. 8 mm				
Back machining max. tapping diameter		M8 (cutting tap)				
Back spindle speed		Max. 10,000 min^{-1}				
Gang tool post rotary tool						
Max. drilling diameter		dia. 8 mm				
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				
Chuck for drill sleeve		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

Basic information	Energy usage	Power supply voltage	AC200 V
		Electrical power requirement	8.3 kVA
		Load operation average power consumption	4.5 kVA
		Required pneumatic pressure	0.5 MPa
Environmental performance information	Power consumption	Standby power*1	0.338 kW
		Power consumption with model workpiece*2	0.0113 kWh/ cycle
		Power consumption value above converted to a CO_2 value*3	5.6g/cycle
	Air consumption	Required air flow rate*4	52(power ON),55 (normal state)L/min(max.177L/min Max.: during air blow)
	Lubricant consumption	Turning the power on	2.5 cc/ 60 min
	Noise level	Value measured according to JIS	78.4 dB
Approach to environmental issues	Recycling	Indication of the material names of plastic parts	Covered in the instruction manual*5
	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 standby power in the idle stop mode (a function that turns servomotor excitation off when it is not necessary, for example during program editing).
*2: 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.
*3: This is the value converted in accordance with the CHUBU Electric Power CO_2 emissions coefficient for 2019 as published by the Ministry of the Environment.
*4: The "power ON" value is the value immediately after turning the machine power on; the value changes to 0 L/min a certain period after operation is stopped.
*5: 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.

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