CITIZEN

Cincom

L20

Sliding Headstock Type CNC Automatic Lathe

Our bestselling L20, completely renewed

A machine synonymous with the history of Cincom has been designed for the new age with 3 models in a modular design.

Ranging from a 5-axis machine with excellent cost performance to a high-end machine equipped with B axis and a back spindle Y axis, you can select the machine according to the functions you require.

This concept offers unrivalled versatility – two types of gang tool post, five types of opposite tool post and three types of back tool post are available to be specified according to the functions required.

In addition to the versatile modular design, the L20 also focuses on operability and working convenience.

The high level of basic performance found in features like the position adjustable operation panel that makes it possible to monitor the interior of the cutting area while looking at the operation screen; the centralized lubrication system that helps to lessen the maintenance workload; and the coolant tank with a wide opening to facilitate chip clearance, makes the operators' daily work go more smoothly.

Additionally, material up to Ø25 mm can also be supplied as an option. This expands the range of machinable workpieces beyond what was possible with the previous L20. You can also select options such as a workpiece conveyor, chip conveyor, medium pressure coolant devices, LFV cutting function and more.

Position adjustable operation panel
By swiveling the position adjustable operation panel, you can perform operations while viewing the machining area.

In-machine lighting
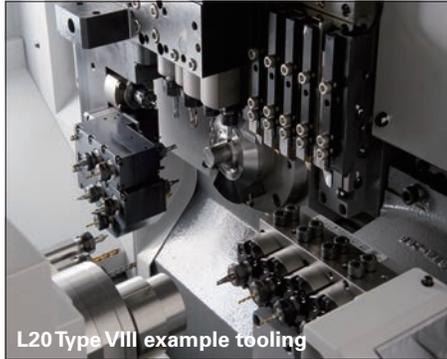Low energy LED lighting provides excellent brightness, clarity and visibility.

NC program I/O
NC programs can be input and output using a USB memory stick or compact flash card.
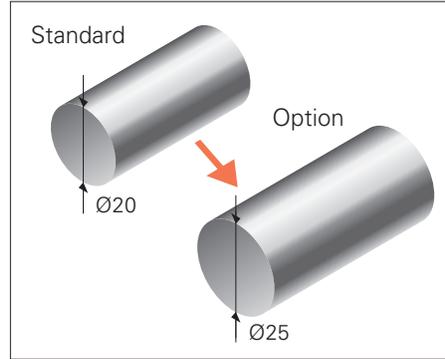
Stable, powerful & productive with versatile modular design

With the current shift in the manufacturing industry, the requirement is for variable-lot machining of a wide range of workpieces. In order to meet this requirement, Citizen has introduced Modular Design. We allow the selection of functions corresponding to a diverse range of machining needs, and help customers optimize their manufacturing by combining these functions to achieve their ideal machine configuration.

L20 Type VIII example tooling

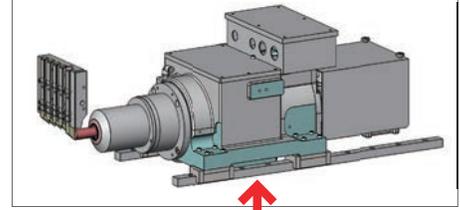**L20 Type XII example tooling**

Standard

Option

Ø20

Ø25

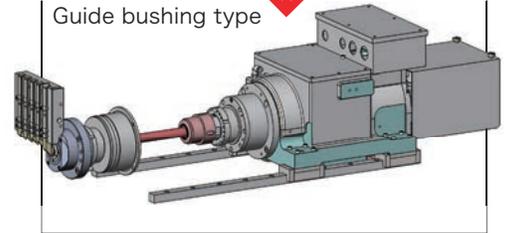**Ø20mm max. bar as standard; Ø25mm as option**
Supply of bar stock up to Ø25mm is supported as an option. The machining length per chucking is 200mm (Ø20mm) and 188mm (Ø25mm).
Note: The optional long workpiece unit supports workpieces up to Ø20mm.
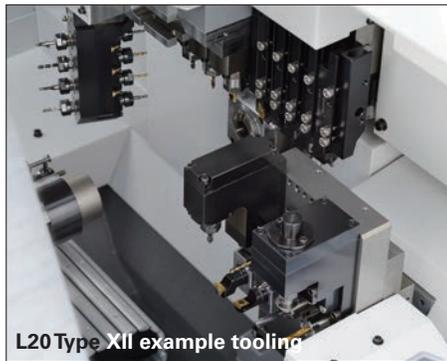

Non-guide bushing type

Guide bushing type

Ability to use with or without a guide bushing
Guide bushing or non-guide bushing type can be selected as appropriate when machining long, thin workpieces, when using cold drawn material, and in order to leave short remnant bars.
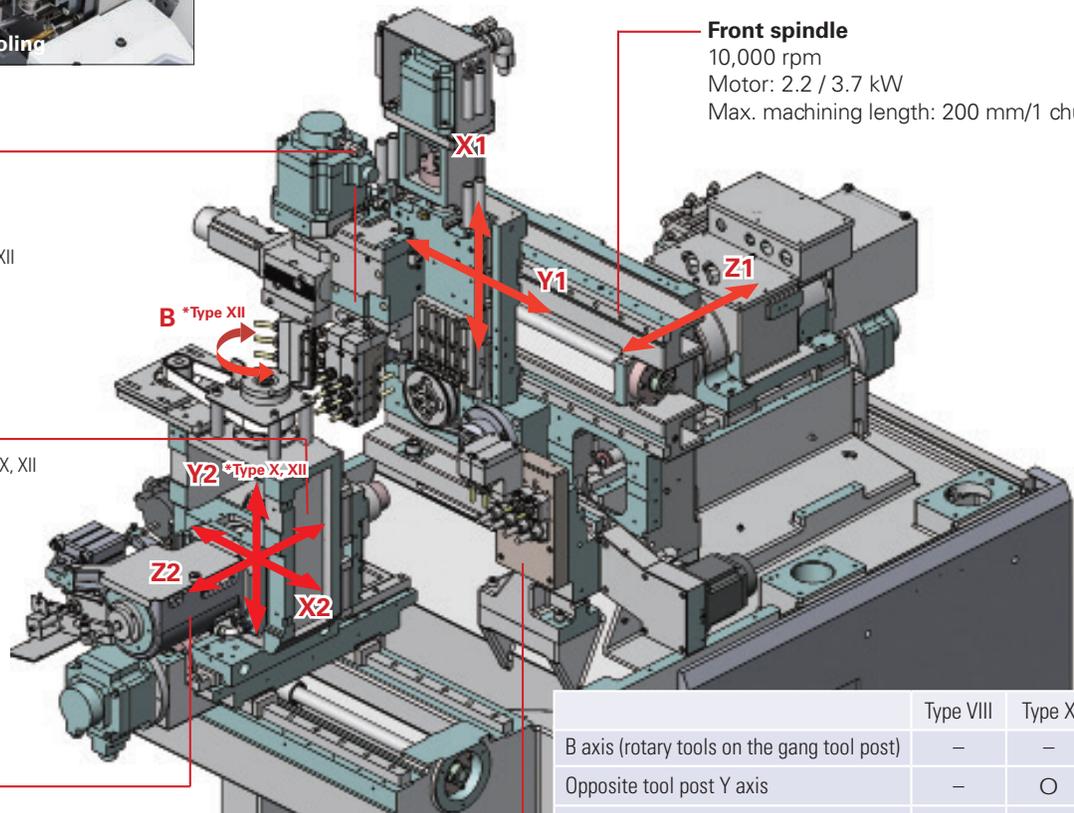

Front spindle
10,000 rpm
Motor: 2.2 / 3.7 kW
Max. machining length: 200 mm/1 chucking (GB)

Rotary tools on the gang tool post
9,000 rpm (Max)

B-axis rotary tools *Type XII
12,000 rpm (Max)
Motor: 2.2 kW

B *Type XII

Opposite tool post rotary tools *Option for Type X, XII
7,500 rpm (Max)
6,000 rpm (rating)
Motor: 0.75 kW

X1
Y1
Z1
Y2 *Type X, XII
Z2
X2

Back spindle
10,000 rpm (Max)
Motor: 0.75 / 2.2 kW

Rotary tools on the back tool post
7,500 rpm (Max)
6,000 rpm (rating)
Motor: 0.75 kW

		Type VIII	Type X	Type XII
B axis (rotary tools on the gang tool post)		–	–	O
Opposite tool post Y axis		–	O	O
	Number of tools	3	6	6
	Rotary tools	–	O	O
Back tool post	Number of tools	4	8	8
	Rotary tools	O	O	O

Ease-of-use makes the operator's work go smoothly

Many features with a high level of basic performance bring convenience to manufacturing

A. Product receiver box

B. Coolant nozzle

C. Chip receiver box

D. Central lubrication device

E. Workpiece conveyor

A. The workpiece gripped in the back spindle is unloaded into the product chute for collection.

B. Coolant can be supplied from various directions depending on the machining circumstances.

C. With its large opening, the chip collection port is designed for easy cleaning.

D. Supplying lubricating oil to all ball screws with this device eliminates the need for manual greasing.

E. This option is very easy to use; the conveying route can be opened up in a one-touch operation.

LFV Function (Optional)

LFV (Low Frequency Vibration) cutting is a technology for performing machining while vibrating the S 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 as well as the machining of difficult-to-cut materials.

Vibration Mode

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

Representation of the cutting

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

Chips generated by customary cutting

Chips generated with LFV cutting

LFV Specifications

Model	Type	Front side LFV (X1, Z1)	Back tools LFV (X2, Z2)
L20	VIII	O (Conventional cutting on the back side)	O (Conventional cutting on the front side)
	X, XII	O	X

Note 1. On the L20X & XII models, LFV machining cannot be performed on the back ($2) side.

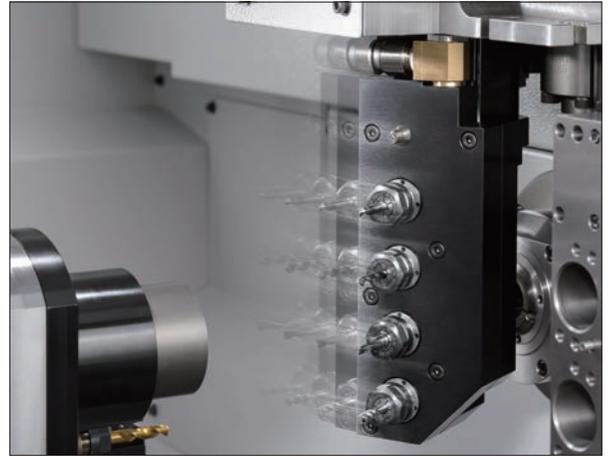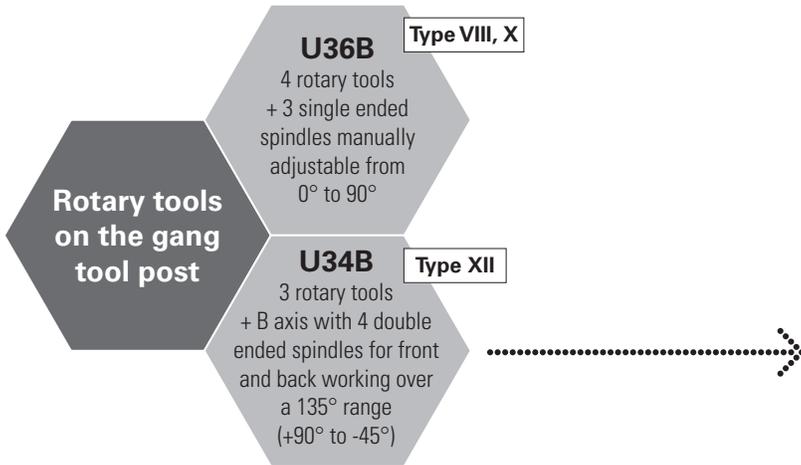Note 2. LFV machining cannot be performed with the Y axis.

Note 3. LFV machining can be performed simultaneously on a maximum of one pair of axes.

Note 4. Simultaneous LFV machining on the Z1 axis on the front side and Z2 axis on the back side is not possible on the VIII model.
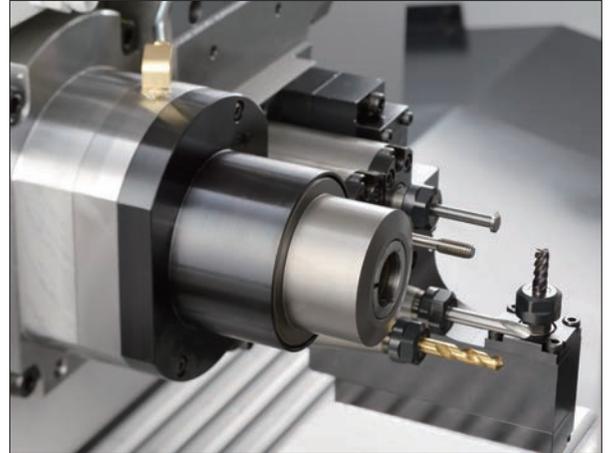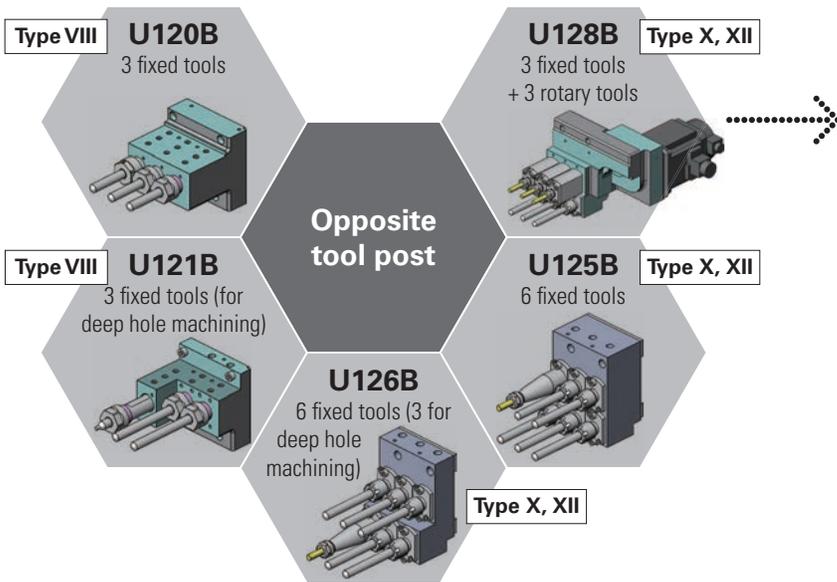
Note 5. For LFV machining with rotary tools, the "LFV function" and "rotary tool feed per revolution" options are required.

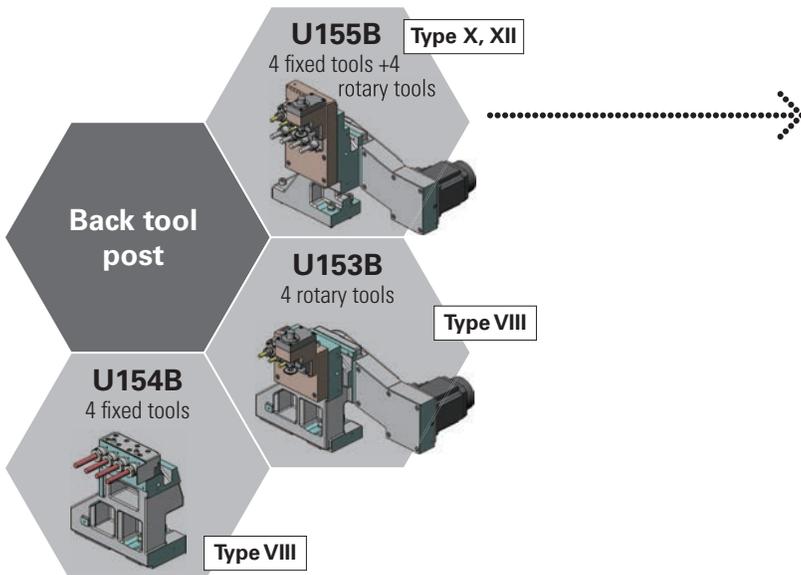# Selectable modules to improve your productivity & profitability

Function modules that can be combined without restrictions

Rotary tools on the gang tool post

U36B — Type VIII, X
4 rotary tools + 3 single ended spindles manually adjustable from 0° to 90°

U34B — Type XII
3 rotary tools + B axis with 4 double ended spindles for front and back working over a 135° range (+90° to -45°)

Features a B axis for rotary tools on the gang tool posts of Type XII machine as standard; it can be set over a 135° range from 90° to -45°.

Opposite tool post

U120B — Type VIII
3 fixed tools

U121B — Type VIII
3 fixed tools (for deep hole machining)

U128B — Type X, XII
3 fixed tools + 3 rotary tools

U125B — Type X, XII
6 fixed tools

U126B — Type X, XII
6 fixed tools (3 for deep hole machining)

For the opposite tool post, a tool post that is capable of pinch milling or one that can handle deep hole machining can also be selected as options.

Back tool post

U155B — Type X, XII
4 fixed tools +4 rotary tools

U153B — Type VIII
4 rotary tools

U154B — Type VIII
4 fixed tools

The back tool post on Type X and XII machines can accommodate a total of 8 tools: 4 rotary tools in the upper row and 4 fixed tools in the lower row.
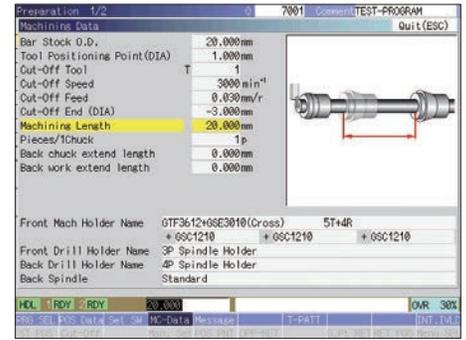
Intuitive screen display is readable at a glance

Equipped with high-speed NC
The latest NC model drastically reduces the start-up and screen switching time compared to conventional machines with advanced functions.
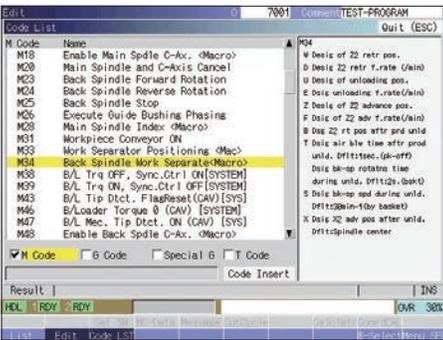

On-machine program check function
Using manual handle feed, operations can be run in the forward or reverse directions, and you can temporarily stop program operation, edit the program and then restart the operation.
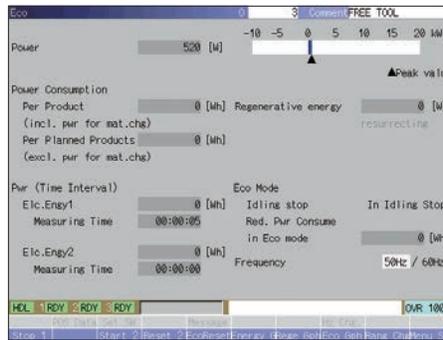

Display of easily understood illustrations
Illustrations appropriate for each item are displayed. You can see what they mean at a glance (the screen shown above displays the machining data).
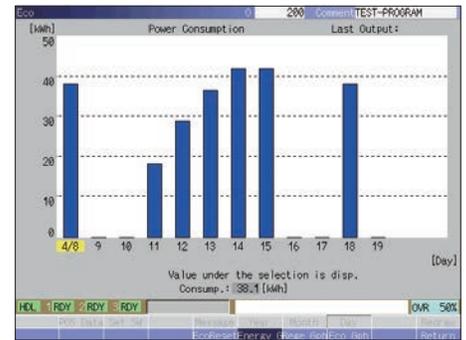

Code list display
The function displays the list of G and M codes including explanations to aid programming.

Eco screen
The current power consumption is shown on the screen, along with the cumulative power consumption, and the power regeneration (generation) status.

Eco screen (example graph display)
The machine's power consumption can also be shown in the form of an easy to understand graph.

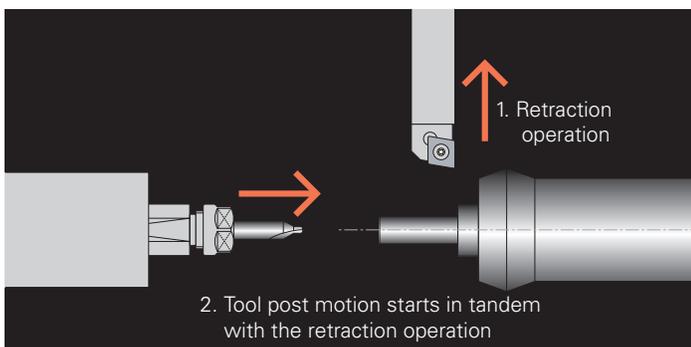# The next process starts before the current one ends

Cincom Control saves time between processes

Cincom Control
We have developed a new control system unique to Citizen that realizes fast and smooth operation. It reduces idle time and achieves faster rapid feed together with substantial shortening of cycle time.
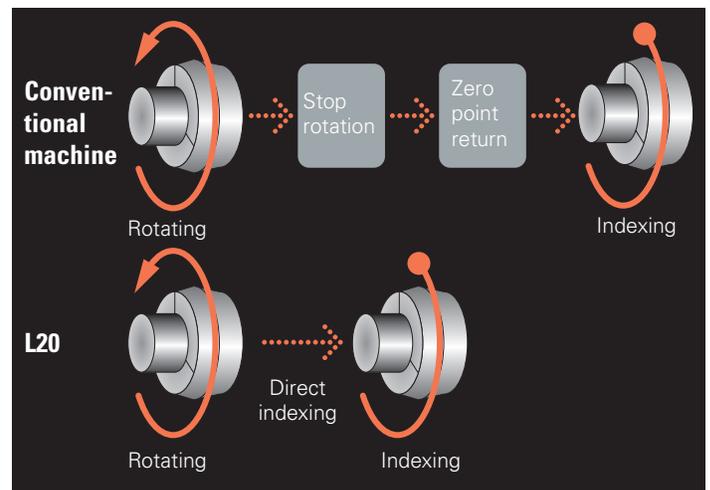
Multiple tool post overlapping function
Independent opposite and gang tool posts are provided. In front machining, idle time has been completely eliminated by using a unique control method whereby the tool post to be used next starts the preparation for machining without waiting for the other one to complete its retraction operation.

Direct spindle indexing function
This substantially reduces spindle indexing time. When indexing the spindle, this function allows the spindle to be decelerated and stopped at the required index position by specifying this position with a C-axis command while the spindle is rotating. This eliminates the idle time up until rotation stops, and improves working efficiency.

1. Retraction operation

2. Tool post motion starts in tandem with the retraction operation

Conventional machine — Rotating → Stop rotation → Zero point return → Indexing

L20 — Rotating → Direct indexing → Indexing

Machine layout

■ L20 Standard Machine

1175

335

1835

L2

L1

500

2320

1220

600

500

2120

500

3120

■ L20 Option-installed Machine

1139

103

500

1220

600

28

253

500

1050

2120

500

3-color signal tower

Long workpiece device

Chip conveyor

2248

1432

1157

758

1835

Machine Specifications

Item	Type VIII L20E-2M8	Type X L20E-2M10	Type XII L20E-2M12
Max. machining diameter (D)	Ø20 mm (Ø25 option)		
Max. machining length (L)	GB:200 mm/1chucking (188 mm: Ø25 spec.) NGB: 2.5D		
Spindle through-hole diameter	Ø26 mm		
Main spindle speed	Max.10,000 rpm		
Max. chuck diameter of back spindle	Ø20 mm (Ø25 option)		
Max. protrusion length of back spindle workpiece	30 mm		
Max. protrusion length	80 mm		
Back spindle speed	Max.10,000 rpm		
Gang rotary tool spindle speed	Max.9,000 rpm (12,000 rpm: B axis Type XII)		
Front rotary tool spindle speed (type X, XII)	–	Max. 7,500 rpm (Rating 6,000 rpm)	
Back tool post rotary tool spindle speed	Max. 7,500 rpm		
Number of tools to be mounted (max.)	37	44	40
Gang turning tool	5		
Gang rotary tool	25	25	21
Front drilling tool	3	6	
Back drilling tool	4	8	
Tool size			
Gang turning tool	½"		
Sleeve	¾"		
Chuck and bushing			
Main spindle collet chuck	TF25 (TF30: Ø25 mm)		
Back spindle collet chuck	TF25 (TF30: Ø25 mm)		
Rotary tool collet chuck	ER11, ER16		
Chuck for drill sleeves	ER11, ER16		
Guide bushing	TD25NS (CD25: Ø25 mm)		
Rapid feed rate			
All axes (except Y2)	32 m/min		
Y2 axis	–	8 m/min	
Motors			
Spindle drive	2.2 / 3.7 kW		
Gang tool post rotary tool drive	2.2 kW		
Back spindle drive	0.75 / 2.2 kW		
Back tool post rotary tool drive	0.75 kW		
Front rotary tool drive	0.75 kW		
Coolant oil	0.4 kW		
Lubricating oil	0.003 kW		
Center height	1,050 mm		
Rated power consumption	7.3 kVA		
Full-load current	32A		
Main breaker capacity	40A		
Air pressure	0.5 MPa		
Weight	5,182 lbs	5,292 lbs	

Standard accessories

Main spindle chucking unit
Back spindle chucking unit
Rotary guide bushing unit
Gang rotary tool driving unit
Coolant unit (with level detector)
Lubricating oil supply unit
 (with level detector)
Machine relocation detector

Door lock
Cut-off tool breakage detector
Workpiece separator
Lighting
Main spindle coolant unit
Front rotary tool unit (type X, XII)
Back tool post rotary unit

Optional accessories

Knock-out jig for through-hole
 workpiece
Workpiece conveyor
Chip conveyor

Coolant flow rate detector
Signal lamp
3-color signal tower

Standard NC functions

CINCOM SYSTEM M70LPC-VU
 (Mitsubishi)
8.4 inch color LCD
USB slot
Program storage capacity: 160m
 (approx. 64KB)
Tool offset pairs : 40
Product counter indication (up to 8 digits)
Operating time display function
Machine operation information display
Multiple repetitive cycle for turning
B axis control function *Type XII
Interference check function
Spindle speed change detector
Constant surface speed control function
Automatic power-off function
On-machine program check function
Chamfering, corner R
Nose radius compensation
Eco indication
Variable lead thread cutting
Arc threading function
Geometric functions

Spindle synchronized function
Spindle C-axis function
Milling interpolation
Back spindle C-axis function
Back spindle chasing function
Canned cycle drilling
Rigid tapping function
High speed rigid tapping function
Synchronized tapping phase
 adjustment function
Differential speed rotary tool
 function
Tool life management I
Tool life management II
External memory program driving
User macros
Helical interpolation function
Hob function
Polygon function
Inch command
Sub inch command
Network I/O function

Optional NC functions

Tool offset pairs: 80
Optional block skip (9 sets)
Back machining program skip function
Program storage capacity 600m
 (approx. 240KB)

Environmental Information

Basic Information	Energy Usage	Power supply voltage	AC200 V
		Electrical power requirement (Max)	7.3 kVA
		Required pneumatic pressure	0.5 MPa
Environmental Performance Information	Power Consumption	Standby power*1	0.300 kW
		Power consumption with model workpiece*2	0.0113 kWh/cycle
		Power consumption value above converted to a CO2 value*3	5.4 g/cycle
	Air Consumption	Required air flow rate	53 NL/min (max. 210 NL/min., during air blow)
	Lubricant Consumption	At power ON	2.5 cc/60 min
	Noise Level	Value measured based on JIS	75.2 dB
Approach to Environmental Issues	Environmental Load Reduction	RoHS Directive / REACH regulations	Compliant
	Recycling	Indication of the material names of plastic parts	Covered in the instruction manual *4
	Environmental Management	We are ISO14001 accredited. We pursue "Green Procurement" by prioritizing purchases for 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 CO2 emissions coefficient for 2009 as published by the Ministry of the Environment.
*4: 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.

Marubeni Citizen-Cincom Inc.