Cincom L20
Sliding Headstock Type CNC Automatic Lathe
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.

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.

**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.

**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

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

**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

**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.*

**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)

<table>
<thead>
<tr>
<th>Type VIII</th>
<th>Type X</th>
<th>Type XII</th>
</tr>
</thead>
<tbody>
<tr>
<td>B axis (rotary tools on the gang tool post)</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Opposite tool post Y axis</td>
<td>–</td>
<td>O</td>
</tr>
<tr>
<td>Number of tools</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Rotary tools</td>
<td>–</td>
<td>O</td>
</tr>
<tr>
<td>Back tool post Number of tools</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>Rotary tools</td>
<td>O</td>
<td>O</td>
</tr>
</tbody>
</table>

L20 Type VIII example tooling
L20 Type XII example tooling
Non-guide bushing type
Guide bushing type
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

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**

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

**Waveform**

<table>
<thead>
<tr>
<th>Spindle phase (degrees)</th>
<th>LFV mode 1</th>
<th>LFV mode 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1.0</td>
<td>2.0</td>
</tr>
<tr>
<td>1.0</td>
<td>1.0</td>
<td>2.0</td>
</tr>
<tr>
<td>2.0</td>
<td>1.0</td>
<td>2.0</td>
</tr>
<tr>
<td>3.0</td>
<td>1.0</td>
<td>2.0</td>
</tr>
<tr>
<td>4.0</td>
<td>1.0</td>
<td>2.0</td>
</tr>
<tr>
<td>5.0</td>
<td>1.0</td>
<td>2.0</td>
</tr>
</tbody>
</table>

**LFV Specifications**

<table>
<thead>
<tr>
<th>Model</th>
<th>Type</th>
<th>Front side LFV (X1, Z1)</th>
<th>Back tools LFV (X2, Z2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>L20</td>
<td></td>
<td>O (Conventional cutting on the back side)</td>
<td>O (Conventional cutting on the front side)</td>
</tr>
<tr>
<td>X, XII</td>
<td></td>
<td>O</td>
<td>X</td>
</tr>
</tbody>
</table>

Note 1. On the L20X & XII models, LFV machining cannot be performed on the back (Z2) 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.

**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

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

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

Opposite tool post

- **U120B**
  - 3 fixed tools
  - Type VIII

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

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

- **U128B**
  - 3 fixed tools + 3 rotary tools
  - Type X, XII

- **U125B**
  - 6 fixed tools
  - Type X, XII

Back tool post

- **U154B**
  - 4 fixed tools
  - Type VIII

- **U155B**
  - 4 fixed tools + 4 rotary tools
  - Type X, XII

- **U153B**
  - 4 rotary tools + 4 fixed tools
  - Type X, XII

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°.

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.

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.
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.
Machine layout

■ L20 Standard Machine

■ L20 Option-installed Machine

Long workpiece device
Chip conveyor
3-color signal tower
**Environmental Information**

<table>
<thead>
<tr>
<th>Item</th>
<th>Type VIII</th>
<th>Type X</th>
<th>Type XII</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. machining diameter (D)</td>
<td>Ø20 mm</td>
<td>Ø20 mm</td>
<td>Ø20 mm</td>
</tr>
<tr>
<td>Max. machining length (L)</td>
<td>200 mm</td>
<td>188 mm</td>
<td>200 mm</td>
</tr>
<tr>
<td>Spindle thread/hole diameter</td>
<td>Ø25 mm</td>
<td>Ø25 mm</td>
<td>Ø25 mm</td>
</tr>
<tr>
<td>Main spindle speed</td>
<td>Max. 10,000 rpm</td>
<td>Max. 10,000 rpm</td>
<td>Max. 10,000 rpm</td>
</tr>
<tr>
<td>Max. chuck diameter of back spindle</td>
<td>Ø20 mm (Ø25 option)</td>
<td>Ø20 mm (Ø25 option)</td>
<td>Ø20 mm (Ø25 option)</td>
</tr>
<tr>
<td>Max. protrusion length of back spindle workpiece</td>
<td>30 mm</td>
<td>30 mm</td>
<td>30 mm</td>
</tr>
<tr>
<td>Max. protrusion length</td>
<td>80 mm</td>
<td>80 mm</td>
<td>80 mm</td>
</tr>
<tr>
<td>Back spindle speed</td>
<td>Max. 10,000 rpm</td>
<td>Max. 10,000 rpm</td>
<td>Max. 10,000 rpm</td>
</tr>
</tbody>
</table>

**Environmental Performance Information**

<table>
<thead>
<tr>
<th>Item</th>
<th>Type VIII</th>
<th>Type X</th>
<th>Type XII</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Consumption</td>
<td>2.2 / 3.7 kW</td>
<td>2.2 kW</td>
<td>2.2 kW</td>
</tr>
<tr>
<td>Back spindle drive</td>
<td>0.75 / 2.2 kW</td>
<td>0.75 kW</td>
<td>0.75 kW</td>
</tr>
<tr>
<td>Front rotary tool drive</td>
<td>0.75 kW</td>
<td>0.75 kW</td>
<td>0.75 kW</td>
</tr>
<tr>
<td>Coolant oil</td>
<td>0.4 kW</td>
<td>0.4 kW</td>
<td>0.4 kW</td>
</tr>
<tr>
<td>Lubricating oil</td>
<td>0.003 kW</td>
<td>0.003 kW</td>
<td>0.003 kW</td>
</tr>
<tr>
<td>Center height</td>
<td>1,050 mm</td>
<td>1,050 mm</td>
<td>1,050 mm</td>
</tr>
<tr>
<td>Rated power consumption</td>
<td>7.3 kW</td>
<td>7.3 kW</td>
<td>7.3 kW</td>
</tr>
<tr>
<td>Full-load current</td>
<td>32A</td>
<td>32A</td>
<td>32A</td>
</tr>
<tr>
<td>Main breaker capacity</td>
<td>40A</td>
<td>40A</td>
<td>40A</td>
</tr>
<tr>
<td>Air pressure</td>
<td>0.5 MPa</td>
<td>0.5 MPa</td>
<td>0.5 MPa</td>
</tr>
<tr>
<td>Weight</td>
<td>5,182 lbs</td>
<td>5,292 lbs</td>
<td>5,292 lbs</td>
</tr>
</tbody>
</table>

**Approach to Environmental Issues**

<table>
<thead>
<tr>
<th>Item</th>
<th>Type VIII</th>
<th>Type X</th>
<th>Type XII</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy Usage</td>
<td>Power supply voltage: 208V</td>
<td>Power supply requirement (Max): 7.3 kVA</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Required pneumatic pressure: 0.5 MPa</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Environmental Load Reduction</td>
<td>0.0013 kWh/cycle</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.4 kWh/cycle</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Air Consumption</td>
<td>0.33 kW</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.54 kW</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lubricant Consumption</td>
<td>2.5 l/hr/30 min</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Noise Level</td>
<td>75.2 dB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recycling</td>
<td>Indication of the material names of plastic parts</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Environmental Management</td>
<td>We are ISO14001 accredited</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**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
- Machine relocation detector

**Optional accessories**

- Knock-out jig for through-hole workpiece: Coolant flow rate detector
- Workpiece conveyor: Signal lamp
- Chip conveyor: 3-color signal tower

**Standard NC functions**

- CNC/COM SYSTEM M70LPC-VU: Spindle synchronized function
- 8.4 inch color LCD: Spindle C-axis function
- USB slot: Milling interpolation
- Program storage capacity: 160M
- Tool offset pairs: 80
- Product counter indication (up to 8 digits): Rigid tapping function
- Operating time display function: High speed rigid tapping function
- Machine operation information display: Synchronized tapping phase adjustment function
- Multiple repetitive cycle for turning: Differential speed rotary tool function
- B axis control function: Tool life management I
- Interference check function: Tool life management II
- Spindle speed change control function: External memory program driving
- Constant surface speed control function: User macros
- Automatic power-off function: Helical interpolation function
- On-machine program check function: Hob function
- Chamfering, corner R: Polygon function
- Radius compensation: Inch command
- Eco indication: Sub inch command
- Variable lead thread cutting: Network I/O function
- Arc threading function: Geometric functions

**Optional NC functions**

- Tool offset pairs: 80
- Optional block skip (9 sets)
- Back machining program skip function
- Program storage capacity: 660M

**Machine Specifications**

- Front drilling tool: 4
- Back drilling tool: 8
- Rapid feed rate: 32 m/min
- Y2 axis: 8 m/min
- Motor: 0.75 kW / 2.2 kW
- Motors: ER11, ER16

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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.