Efficient Production – Impressive Value
Citizen’s highly successful K series evolves for the new age to meet the needs of the changing global market

**Up to 23 tools**
To meet the trend to produce complex parts on a lower cost machine

**Flexible tooling layout**
Up to 8 rotary tools can be mounted including cross drilling/milling, face drilling and slitting

**Now with back slitting and back cross drilling capability**
Same holder is adaptable for both slitting and cross drilling

**Faster processing**
New control delivers significant cycle time savings for complex parts

**Citizen’s renowned ease of use**
Citizen is the machine of choice for fast set-ups and changeovers. The new control and user interface makes using the K series even easier than before

**Citizen’s unique Cincom Control cuts non-cutting time to a minimum**
Citizen’s dynamic software development leads the Swiss type/sliding head sector

**Rigid and compact**
The acclaimed rigid but compact construction of the previous K series is carried forward with the Evolution Line

**High speed spindle**
15,000 rpm main spindle is standard

**Improved back spindle torque**
The back spindle has improved torque at low rpm

---

**K16E Workpiece Examples**

<table>
<thead>
<tr>
<th>Parts for industrial machinery</th>
<th>Medical equipment parts</th>
<th>Communication device parts</th>
<th>Electronic device parts</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Part" /></td>
<td><img src="image2.png" alt="Part" /></td>
<td><img src="image3.png" alt="Part" /></td>
<td><img src="image4.png" alt="Part" /></td>
</tr>
</tbody>
</table>

---

02 Cincom K16E
Cincom Control cuts non-cutting time to a minimum

Cincom Control
Citizen has developed a new control method system for high-speed, smooth axis motion. Cincom Control reduces idle time, increases feed rates and substantially reduces cycle time.

Tool Overlap Function
For front machining, the K16E is equipped with an independently controlled gang tool holder and opposed tool holder. Cincom Control positions the next tool holder while previous tool holder retracts.

Idle time reduced further
Even in comparison with the previous K series which substantially improved productivity, the K16E has slashed idle time still further and shortened cycle time.

Example targets for idle time cuts

Tool selection/machining pattern switching processing time
The processing speed in operations where a tool is called by a command such as T01* or operations where a machining pattern is declared by a command such as G610, has been speeded up by installing the latest NC unit and reviewing the macro processing.

Chuck opening/closing time
The chuck opening/closing operations of the front and back spindles have been speeded up by changing the chuck mechanism.

Spindle indexing time
Direct spindle indexing operation controlled by Cincom Control has been speeded up by the installation of the latest NC unit.

Direct Spindle Indexing
The direct spindle indexing function significantly reduces spindle indexing time. The spindle decelerates directly into the required index position, eliminating the time taken to stop, reference and index.

Sample work 1

Tool selection/machining pattern switching processing time
Machining pattern switching processing time
Chuck opening/closing time
Spindle indexing time

Sample work 2

Cycle Time 45.0 sec
K16E
Cycle Time 97.7 sec
K16E
Cycle Time 100.7 sec

* These are examples for comparison using samples. The effects of reduction on idle time will vary depending on the workpiece being machined.
Efficient, fast and highly productive

Covers wide range of complex machining needs and allows selection of the machine configuration to suit your applications.

Mixed production makes high demands on the flexibility, performance and efficiency of a machine. The Cincom K series proves its worth in every aspect. Its particular strength lies in the production of high-accuracy complex parts up to 16 mm diameter in small to medium batch sizes. Next to short set-up times, the K series also offers high productivity and efficiency thanks to faster rapid feed rates, improved axis deceleration/acceleration times of the axes, and faster program processing provided by the new control system.

A rigid machine bed combined with exceptional thermal stability ensures the precision of the machine. Due to the flexible modular tool holder system, holders for virtually any application are available. With its small footprint of just 3.7 x 6.2 ft, this machine offers a very compact and space-saving design.

Citizen’s renowned ease-of-use ensures fast set-ups and rapid changeovers.

---

Rotary tool on the gang tool post
- Spindle speed: 6,000 rpm
- Motor: 0.4 kW

Front spindle
- Spindle speed: 15,000 rpm
- Motor: 2.2 / 3.7 kW
- Max. machining length: 200 mm / 1chucking

Back spindle
- Spindle speed: 10,000 rpm
- Motor: 0.4 kW

---

2-station both face drilling spindle GSE2507 (optional)

Face drilling spindle
GSE2607 (optional)

Cross milling spindle
GSC807

Milling spindle
GSC1107

Back rotary tool unit
U152B

Front 4 tools holder
U121B (ø19.05 mm)

Slitting spindle
GSS1430 (optional)
Outstanding versatility

**GSC807**
**Cross-drilling spindle**
Used for cross-drilling process to end face. This spindle can be mounted on T11 to T14. When one spindle is mounted, another spindle cannot be mounted at an adjacent station. Chuck type: ER11

**GSE2607**
**Front end-face drilling spindle**
Used for eccentric drilling process to end face. This spindle can be mounted on T12 to T14. When one spindle is mounted, another spindle cannot be mounted at an adjacent station. Chuck type: ER11

**GSE2507**
**Double both-end spindle**
Used for eccentric drilling process to end face. This spindle can be mounted on T14 only. Chuck type: ER11

**GSS950**
**Slitting spindle**
Used for slitting process. This spindle can be mounted on T13 only. Maximum cutter size is 50 mm in diameter.

**GSE2707**
**Back end-face drilling spindle**
Used for eccentric drilling process to end face. This spindle can be mounted on T12 to T14. When one spindle is mounted, another spindle cannot be mounted at an adjacent station. Chuck type: ER11

**GSS1430**
**Back slitting spindle**
This is for performing back slitting. This spindle is mounted on back rotary tool post. Max. cutter dia.: $\varnothing 30$ mm Max. collet dia.: $\varnothing 7$ mm Chuck type: ER11 Spindle speed: max 2700 rpm (5/3 reduction).

**GSS1430**
**Back slitting spindle (mounted in cross direction)**
GSS1430 performs cross machining on the workpiece on back spindle. Note: occupies 3 positions of U152B. Chuck type: ER11 Spindle speed: max 2700 rpm

**GSC1107**
**End face drilling spindle**
This is for performing drilling and milling on the back end face. This spindle is mounted on back tool post. Max. collet dia.: $\varnothing 7$ mm Chuck type: ER11

**BDF103**
**1-tool sleeve holder**
Used for drilling with drilling sleeve mounted. This holder can be mounted on T12 to T14. BDF103: $\varnothing 19.05$ mm

**GSE2807**
**Both-end drilling spindle**
Used for eccentric drilling process to end face. This spindle can be mounted on T12 to T14. When one spindle is mounted, another spindle cannot be mounted at an adjacent station. Chuck type: ER11

**GSS1430**
**Back slitting spindle (mounted in cross direction)**
GSS1430 performs cross machining on the workpiece on back spindle. Note: occupies 3 positions of U152B. Chuck type: ER11 Spindle speed: max 2700 rpm

Wide range of tooling and accessories
User friendly design displays the screens that are needed, when they are needed

**Code List Display**
Another aid in programming is a list of G and M codes accompanied by pictorial explanations of their purpose.

**Easy to Understand Illustrations**
An illustration is displayed for each item so that it can be immediately visualized (the screen displaying the machining data).

**On-machine Program Check Function**
This function allows program operation to be run forward or backward, and program editing and continuation of operation after a temporary stop. It is an effective aid to smooth programming. It also has a high speed program check function.

**High-speed NC Installed**
Because the latest CNC unit is used, the start-up time and screen switching times are considerably shorter than on other machines with similar functions. The result is a stress-free operating experience.
K16E Standard Layout

![K16E Standard Layout Diagram]

K16E Machine Layout with Options

![K16E Machine Layout with Options Diagram]
## Machine Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>K16E VII</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum machining diameter (D)</td>
<td>Ø16 mm</td>
</tr>
<tr>
<td>Maximum machining length (L)</td>
<td>200 mm/1 chucking</td>
</tr>
<tr>
<td>Maximum front drilling diameter</td>
<td>Ø10 mm</td>
</tr>
<tr>
<td>Maximum front tapping diameter (tap, die)</td>
<td>M8</td>
</tr>
<tr>
<td>Spindle through-hole diameter</td>
<td>Ø20 mm</td>
</tr>
<tr>
<td>Main spindle speed</td>
<td>15,000 rpm</td>
</tr>
<tr>
<td>Maximum drilling diameter for gang rotary tool</td>
<td>Ø5 mm</td>
</tr>
<tr>
<td>Maximum tapping diameter for gang rotary tool</td>
<td>M4</td>
</tr>
<tr>
<td>Spindle speed of gang rotary tool (Rating)</td>
<td>6,000 rpm (Rating: 4,500 rpm)</td>
</tr>
<tr>
<td>Maximum chuck diameter of back spindle</td>
<td>Ø16 mm</td>
</tr>
<tr>
<td>Maximum protrusion length of back spindle workpiece</td>
<td>40 mm</td>
</tr>
<tr>
<td>Maximum protrusion length</td>
<td>80 mm</td>
</tr>
<tr>
<td>Maximum drilling diameter for back spindle</td>
<td>Ø6 mm</td>
</tr>
<tr>
<td>Maximum tapping diameter for back spindle</td>
<td>M5</td>
</tr>
<tr>
<td>Back spindle speed</td>
<td>10,000 rpm</td>
</tr>
<tr>
<td>Maximum drilling diameter for back tool post rotary tool</td>
<td>Ø5 mm</td>
</tr>
<tr>
<td>Maximum tapping diameter for back tool post rotary tool</td>
<td>M5</td>
</tr>
<tr>
<td>Spindle speed of back tool post rotary tool (Rating)</td>
<td>4,500 rpm (Rating: 3,000 rpm)</td>
</tr>
<tr>
<td>Maximum number of tools to be mounted</td>
<td>23</td>
</tr>
<tr>
<td>Turning tools on the gang tool post</td>
<td>6–7</td>
</tr>
<tr>
<td>Cross rotary tools</td>
<td>4–8</td>
</tr>
<tr>
<td>Rotary tools for front drilling</td>
<td>4</td>
</tr>
<tr>
<td>Tools for front drilling</td>
<td>3–4</td>
</tr>
<tr>
<td>Tool size</td>
<td>□½&quot;</td>
</tr>
<tr>
<td>Sleeve</td>
<td>Ø¾&quot;</td>
</tr>
<tr>
<td><strong>Chuck and Bushing</strong></td>
<td></td>
</tr>
<tr>
<td>Main spindle collet chuck</td>
<td>TF20</td>
</tr>
<tr>
<td>Back spindle collet chuck</td>
<td>TF20</td>
</tr>
<tr>
<td>Rotary tool collet chuck</td>
<td>ER11</td>
</tr>
<tr>
<td>Chuck for drill sleeves</td>
<td>ER11, ER16</td>
</tr>
<tr>
<td>Guide bushing</td>
<td>0201</td>
</tr>
<tr>
<td><strong>Rapid feed rate</strong></td>
<td></td>
</tr>
<tr>
<td>X1 and Y1 axes</td>
<td>24 m/min</td>
</tr>
<tr>
<td>Z1, X2 and Z2 axes</td>
<td>32 m/min</td>
</tr>
<tr>
<td><strong>Motors</strong></td>
<td></td>
</tr>
<tr>
<td>Spindle drive</td>
<td>2.2/3.7 kW</td>
</tr>
<tr>
<td>Gang tool post rotary tool drive</td>
<td>0.4 kW</td>
</tr>
<tr>
<td>Back spindle drive</td>
<td>0.4/0.75 kW</td>
</tr>
<tr>
<td>Back tool post rotary tool drive</td>
<td>0.4 kW</td>
</tr>
<tr>
<td>Coolant oil</td>
<td>0.25 kW</td>
</tr>
<tr>
<td>Lubricating oil</td>
<td>0.003 kW</td>
</tr>
<tr>
<td>Center height</td>
<td>7,050 mm</td>
</tr>
<tr>
<td>Input power capacity</td>
<td>8 kW</td>
</tr>
<tr>
<td>Air pressure and air flow rate for pneumatic devices</td>
<td>0.5 MPa · 70 Nl/min</td>
</tr>
<tr>
<td>Weight</td>
<td>2,200 kg</td>
</tr>
</tbody>
</table>

### Main standard accessories
- Main spindle chucking device
- Rotary guide bushing drive device
- Rotary guide bushing device
- Coolant device (with level sensor)
- Door switch/door lock
- Lubrication device (with level sensor)
- Workpiece separator
- Air seal pneumatic device
- Back spindle chucking device
- Rotary tool spindle drive unit for gang tool and back tool post

### Optional accessories
- Fixed guide bushing device
- Long workpiece device
- Dedicated magazine barfeeder
- Cut-off tool breakage detector
- Workpiece conveyor
- Chip conveyor
- Coolant flow-rate detecting device
- Back spindle 15 degree indexing (with mechanical lock pin)
- Signal lamp
- Work light

### Standard NC functions
- 8.4\(^\circ\) color LCD
- 8-bit B-code function
- Canned cycle for threading
- Chamfer/Circle rounding function
- Constant surface speed control (main & back)
- Continuous threading cycle
- Inch/metric conversion
- Multiple repetitive cycle
- Number of tool offset (40 pairs)
- Program memory (80m tape length)
- Single point threading
- Spindle speed fluctuation detection
- Tool breakage detector (spindle speed check)
- Tool nose radius compensation
- Main/back spindle synchronization
- C-axis control (main)
- C-axis control (back)
- canned cycles for drilling
- User macro
- Milling interpolation
- Polygon turning function
- Hobbing function
- Synchronous tapping
- Differential speed tap function option
- Tool Life Management I
- Tool Life Management II
- Sub inch designation (min. increment 0.00001")
- Helical interpolation
- Slant helical interpolation
- Circular thread cutting
- Variable lead thread cutting
- Geometric command function
- Synchronous tapping phasing function
- External memory running

### Optional NC Functions
- Program memory capacity 160m/320m/600m
- Network I/O function
- Tool offset 80 pairs