Cincom Evolution line from Citizen introducing the K12E and K16E – faster processing with outstanding ease-or-use.

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 & 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
15,000rpm main spindle is standard on both K12 and K16 models

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

K12/16E Workpiece Examples

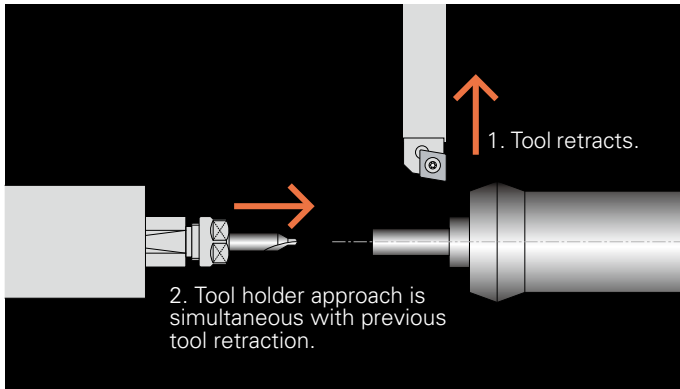| Parts for industrial machinery	Medical equipment parts	Communication device parts	Electronic device parts

Further reductions in cycle times.

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.
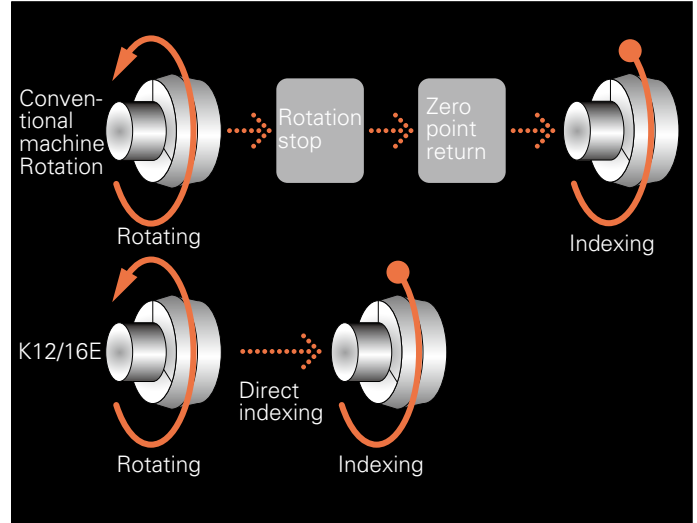
Tool Overlap Function
For front machining, the K12/16E is equipped with independently controlled gang tool holder and opposed tool holder. "*Cincom Control*" positioning next tool holder while previous tool holder extracts.

1. Tool retracts.

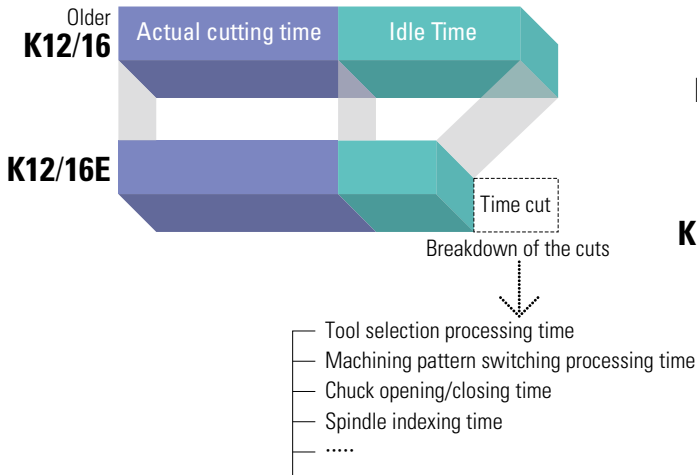2. Tool holder approach is simultaneous with previous tool retraction.

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.

Conventional machine Rotation → Rotating → Rotation stop → Zero point return → Indexing

K12/16E → Rotating → Direct indexing → Indexing

Idle Time Slashed Further

Even in comparison with the previous K series which substantially improved productivity, the K12/16E has slashed idle time still further and shortened cycle time.

Older K12/16: Actual cutting time | Idle Time
K12/16E: Time cut

Breakdown of the cuts
— Tool selection processing time
— Machining pattern switching processing time
— Chuck opening/closing time
— Spindle indexing 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.
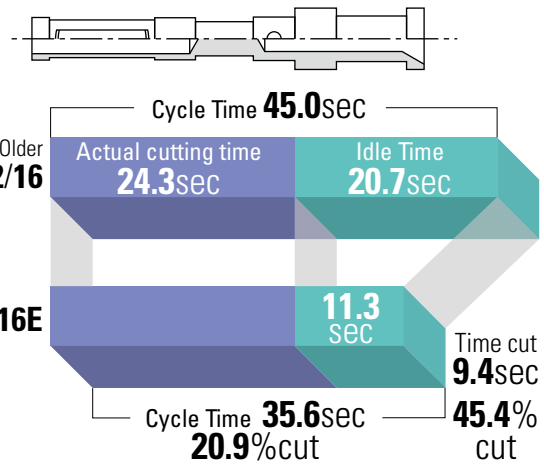
Chuck opening/closing time
The chuck opening/closing operations of the front and back spindles have been speeded up by changing the chuck mechanism.
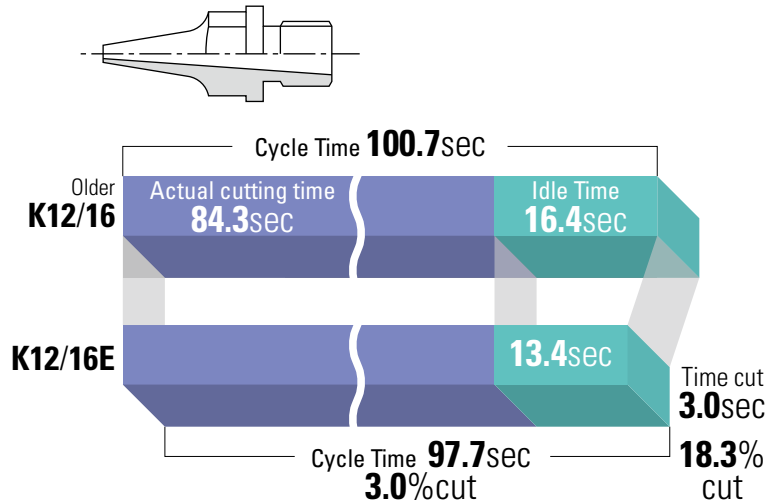
Spindle indexing time
Direct spindle indexing operation controlled by Cincom control has been speeded up by the installation of the latest NC unit.

* These are examples of comparison using samples, and the effects of reduction on idle time will vary depending on the workpiece being machined.

■ Sample work 1

Cycle Time **45.0**sec

Older K12/16: Actual cutting time **24.3**sec | Idle Time **20.7**sec

K12/16E: **11.3** sec

Time cut **9.4**sec **45.4**% cut

Cycle Time **35.6**sec **20.9**%cut

■ Sample work 2

Cycle Time **100.7**sec

Older K12/16: Actual cutting time **84.3**sec | Idle Time **16.4**sec

K12/16E: **13.4**sec

Time cut **3.0**sec **18.3**% cut

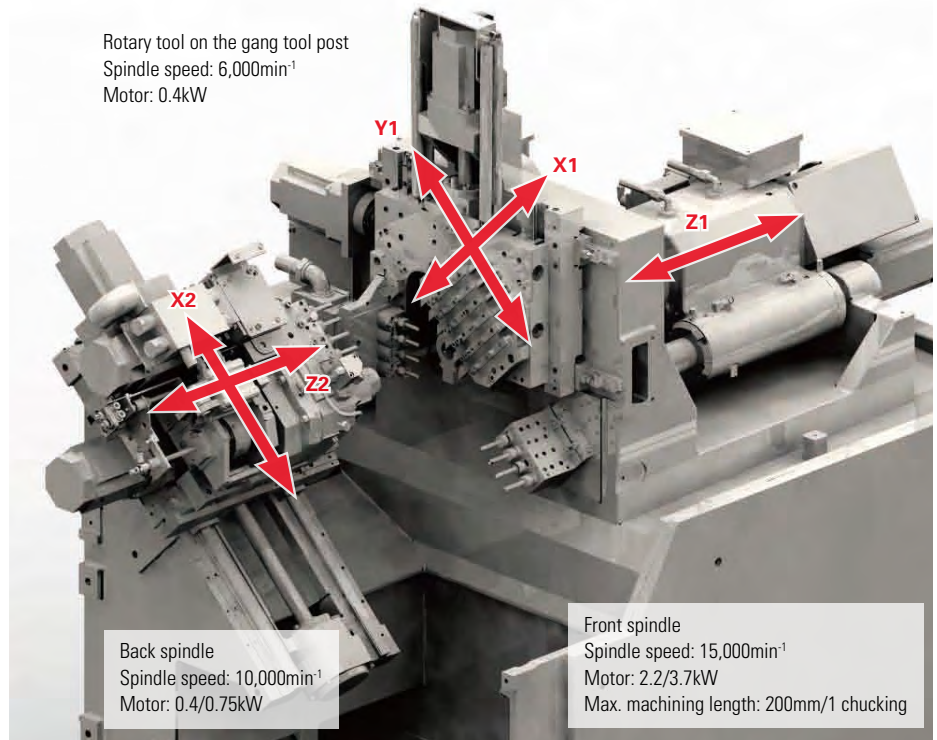Cycle Time **97.7**sec **3.0**%cut

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 & efficiency thanks to faster rapid feedrates, 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 1.13 x 1.88 m, 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: 6,000min^{-1}
Motor: 0.4kW

Back spindle
Spindle speed: 10,000min^{-1}
Motor: 0.4/0.75kW

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

2-station both face drilling spindle
GSE2507

face drilling spindle
GSE2607

Cross milling spindle
GSC807

Back 4 tools holder
U150B$^{\phi20}$/**U151B**$^{\phi19.05}$

Back rotary tool unit
U152B^{Option}

Front 4 tools holder
U120B$^{\phi20}$/**U121B**$^{\phi19.05}$

Milling spindle
GSC1107

Slitting spindle
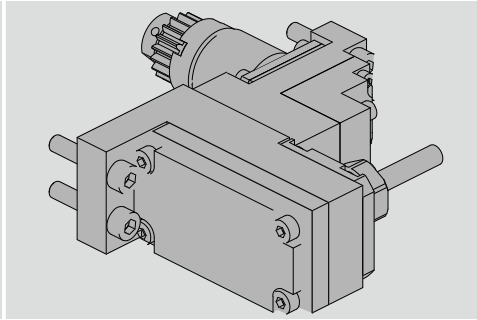**GSS1430**

Wide range of tooling and accessories.

Outstanding versatility.

GSC807
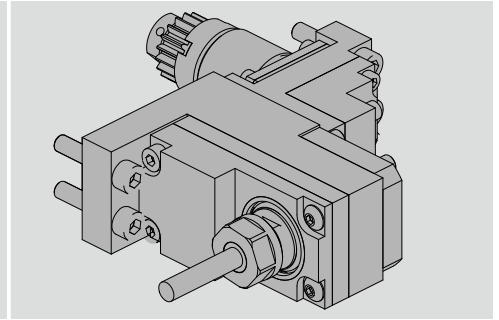**Cross-drilling spindle**
Used for cross drilling and D-cutting.
Up to 4 spindles can be mounted on T11 to T14
in standard configuration.
Chuck type:ER11
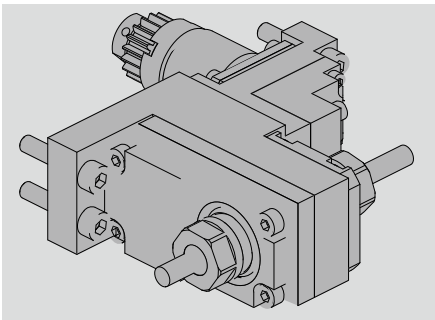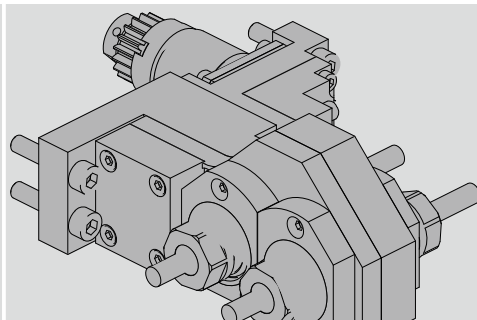
GSE2607
Front end-face drilling spindle
Used for eccentric drilling process to end face. This
spindle can be mounted on T12 to T14 . When one
spindle is mounted, another spindle cannot be
mounted at an adjacent station.
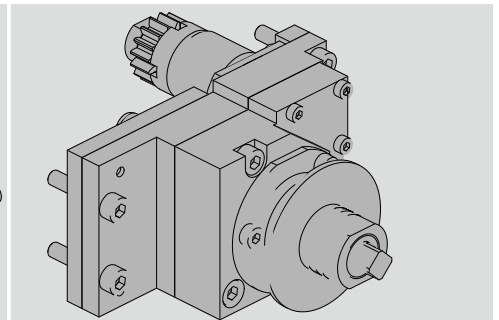Chuck type:ER11

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

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.
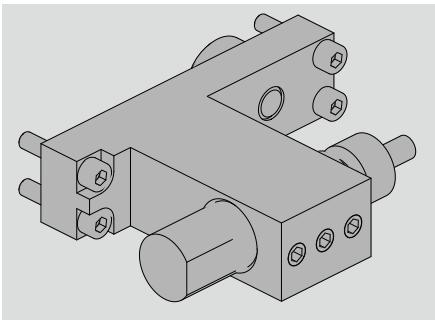Chuck type:ER11

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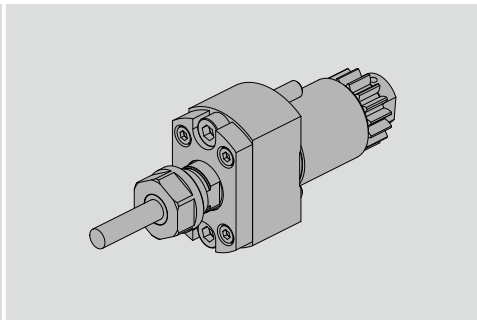Chuck type:ER11

GSS950/1050
Slitting Spindle
Used for slitting process. This spindle can be
mounted on T13 only. Maximum cutter size is 50
mm in diameter.
GSS950:ϕ50×15.875/12.7mm
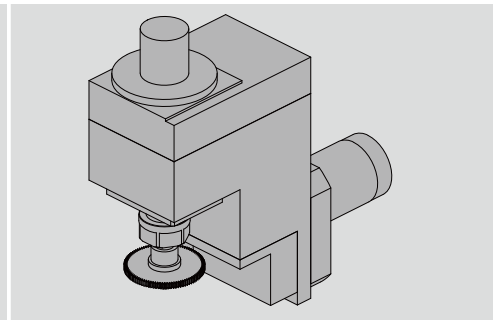GSS1050:ϕ50×16/13mm

BDF103/104
1-tool sleeve holder
Used for drilling with drilling sleeve mounted.
This holder can be mounted on T12 to T14.
GDF103:ϕ19.05mm
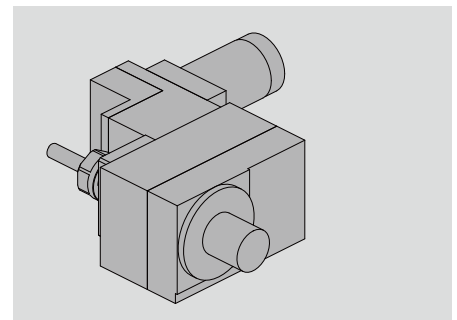GDF104:ϕ20mm

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.:ϕ7mm
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.:ϕ30mm
Max. collet dia.:ϕ7mm
Chuck type:ER11
Spindle speed:max 2700min-1 (5/3reduction)

GSS1430
Back Slitting spindle
(mounted in cross direction)
GSS1430 performs cross machining on the
workpiece on back spindle. Note:occupies 3
positions of U152B.

Convenient operation, keeping you informed in real time.

Support for the operator by displaying the screens that are needed, when they are needed
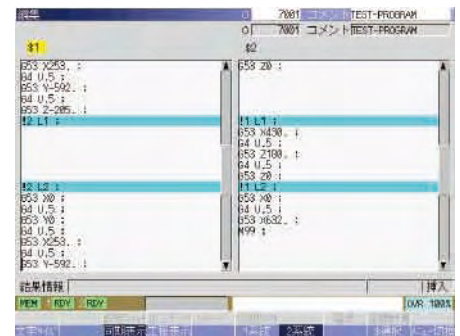

High-speed NC Installed
Because the latest CNC unit is used, the start-up time and screen switching times are considerably shorter than on other machines with similar functions. The result is a stress-free operating experience.
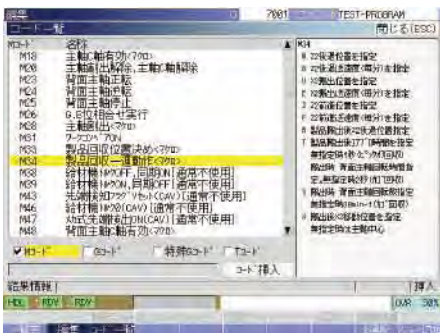

On-machine Program Check Function
This function allows program operation to be run forward or backward, and program editing and continuation of operation after a temporary stop. It is an effective aid to smooth programming. It also has a high speed program check function.

Program Editing
Easy to understand program editing can be performed by switching between the synchronized displays for two axis control groups, and copying and pasting between programs including MDI.
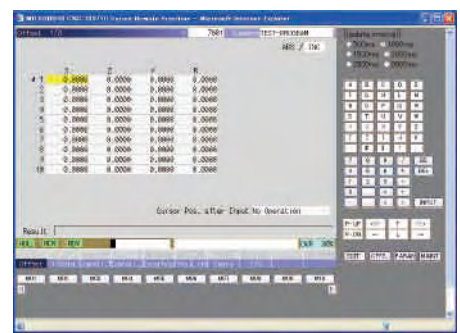

Code List Display
Another aid in programming is a list of G and M codes accompanied by pictorial explanations of their purpose.
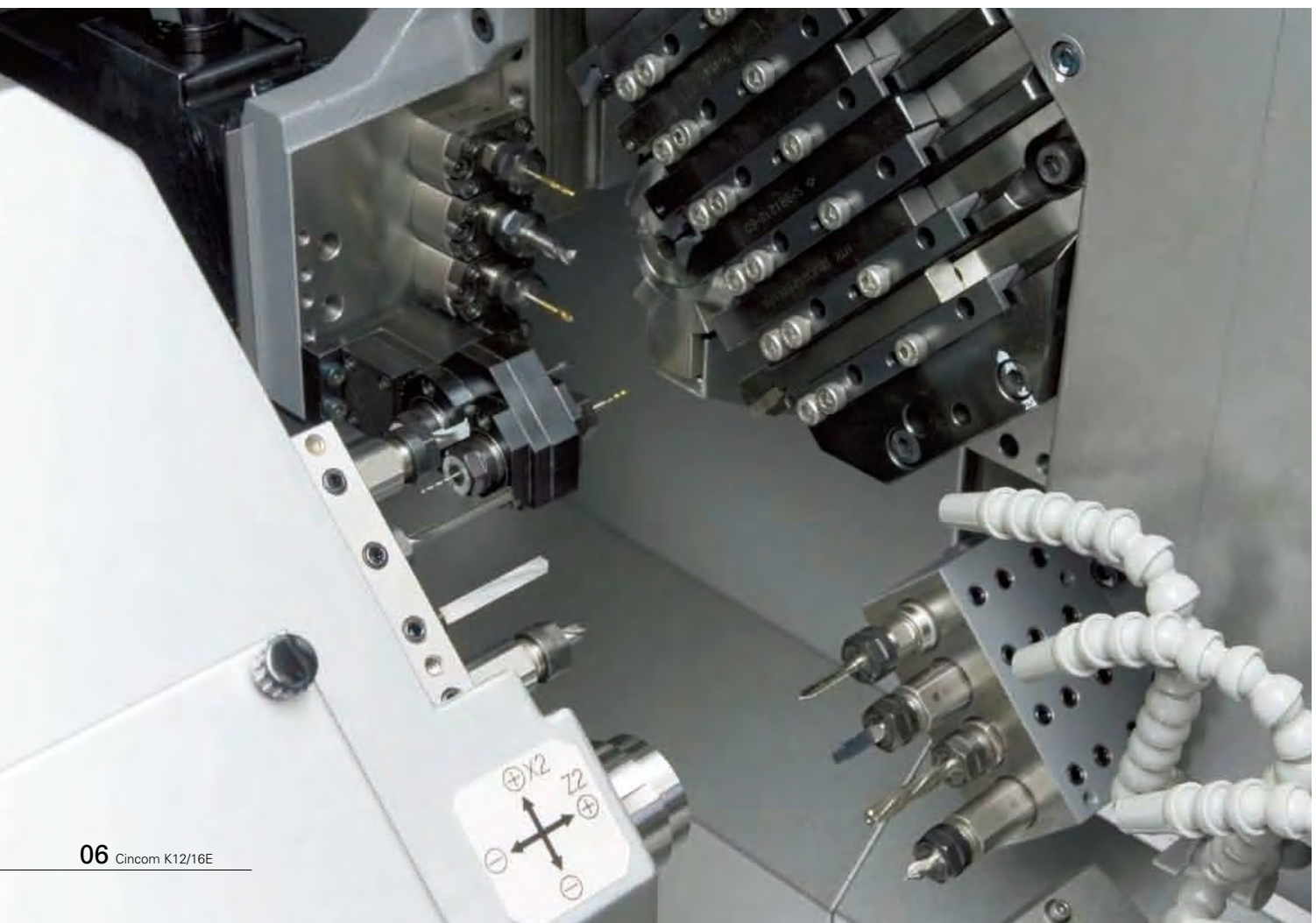

Easy to understand Illustrations
An illustration is displayed for each item, so that it can be immediately visualised (the screen displaying the machining data).
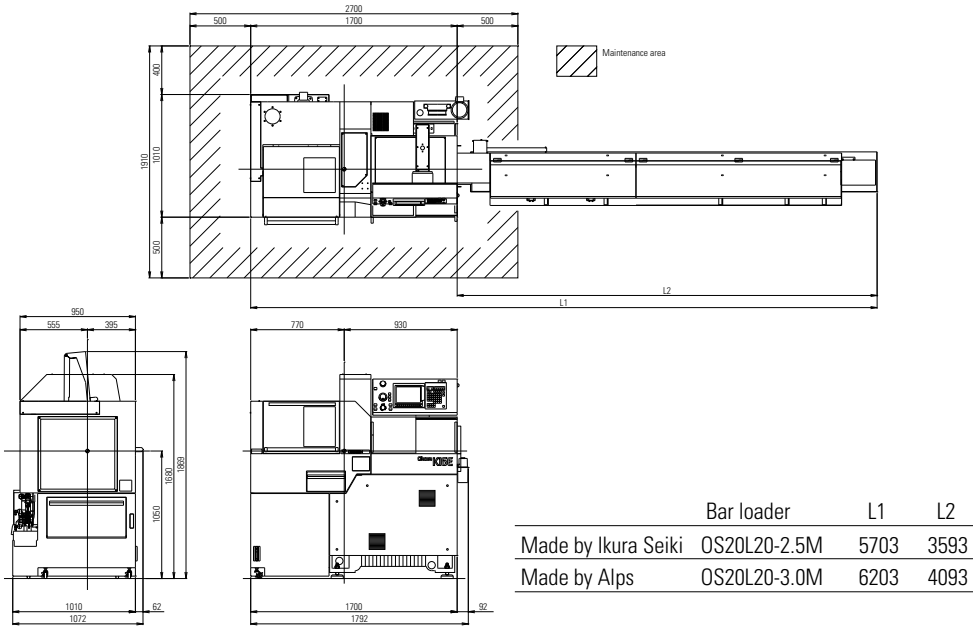

**Remote diagnosis function
(Under development)**
You can edit the NC program and input the offset by remote access with your office PC.

Machine Layout Drawing

■ K12/16E Standard Machine

Bar loader		L1	L2
Made by Ikura Seiki	OS20L20-2.5M	5703	3593
Made by Alps	OS20L20-3.0M	6203	4093

■ K12/16E Option-installed Machine

■ Back spindle torque diagram figure

K12/16 Back Spindle

K12/16E Back Spindle

- ▬ 15 min rating power
- ▬ Contious rating power
- ▬ 15 min rating torque
- ▬ Contious rating torque
- ■ Drill
- ▶ Tapping

Machine Specification

Item	K12E VII	K16E VII
Maximum machining diameter (D)	ϕ12mm	ϕ16mm
Maximum machining length (L)	200mm/1chuking	
Maximum front drilling diameter	ϕ10mm	
Maximum front tapping diameter (tap, die)	M8	
Spindle through-hole diameter	ϕ16mm	ϕ20mm
Main spindle speed	15,000min^{-1}	
Max. drilling diameter for the gang rotary tool	ϕ5mm	
Max. tapping diameter for the gang rotary tool	M4	
Spindle speed of the gang rotary tool (Rating)	6,000min^{-1}(Rating:4,500min^{-1})	
Max. chuck diameter of the back spindle	ϕ12mm	
Max. protrusion length of the back spindle workpiece	40mm	ϕ16mm
Maximum protrusion length	80mm	
Max. drilling diameter for the gang rotary tool	ϕ6mm	
Max.tapping diameter for the gang rotary tool	M5	
Back spindle speed	10,000min^{-1}	
Max. drilling diameter for the back tool post rotary tool	ϕ5mm	
Max.tapping diameter for the back tool post rotary tool	M5	
Spindle speed of the back tool post rotary tool (Rating)	4,500min^{-1}(Rating:3,000min^{-1})	
Number of tools to be mounted	23 (Max)	
Turning tools on the gang tool post	6〜7	
Cross rotary tools	4〜8	
Rotary tools for front drilling	4	
Tools for front drilling	3〜4	
Tool size		
Tool (gang tool post)	□12mm (□10mm,□13mm)	
Sleeve	ϕ20mm (ϕ19.05mm)	
Chuck and bushing		
Main spindle collet chuck	FC096-M	
Back spindle collet chuck	FC096-M-K	FC261-M
Rotary tool collet chuck	ER11	FC261-M-K
Chuck for drill sleeves	ER11, ER16	
Guide bushing	WFG541-M,WFG551-M	
Rapid feed rate		WFG660-M
X1 and Y1 axes	24m/min（Composite speed:34m/min）	
Z1, X2 and Z2 axes	32m/min	
Motors		
Spindle drive	2.2/3.7kW	
Gang tool post rotary tool drive	0.4kW	
Back spindle drive	0.4/0.75kW	
Back tool post rotary tool drive※	0.4kW	
Coolant oil	0.25kW	
Lubricating oil	0.003kW	
Center height	1050mm	
Input power capacity	8kVA	
Air pressure and air flow rate for pneumatic devices	0.5MPa・70Nl/min	
Weight	2200kg	

※The back tool post rotary tool is option.

Standard accessories

Main spindle chucking device	Lubricating oil supply unit (with level detector)
Back spindle chucking device	Machine relocation detector
Gang rotary tool driving devices	Door lock
Coolant device (with level detector)	Workpiece separator

Special Accessories

Rotary guide bushing device (motor-driven type)	Medium-pressure coolant device
Rotary guide bushing device（dog type）	Coolant flow rate detector
Cut-off tool breakage detector	Signal lamp
Knock-out jig for through-hole workpiece	3-color signal tower
Workpiece conveyor	Lighting
Chip conveyor	

Standard NC functions

NC unit dedicated to the K1216	Constant furface speed control function
8.4 inch color liquid crystal display (LCD)	Automatic power-off function
Program storage capacity : 40m	Main spindle indexing at 1° intervals
Tool offset pairs : 40	On-machine program check function
Product counter indication (up to 8 digits)	Chamfering, corner R
Spindle speed change detector	Back spindle chasing function

Special NC functions

Variable lead thread cutting	Tool offset pairs : 80
Arc threading function	Tool life management I
Geometric function	Tool life management II
Spindle synchronized function	Program storage capacity 600m
Spindle C-axis function	External memory program driving
Milling interpolation	Submicrom commands
Back spindle 1°indexing function	User macros
Back spindle C-axis function	Helical interpolation function
Multiple repetitive cycle for turning	Inclined helical interpolation function
Canned cycle drilling	Hob function
Rigid tapping function	Polygon function
High speed Rigid tapping function	Inch command
Differential speed rotarytool function	Sub inch command