

CITIZEN

Miyano

RL01

CNC Lathe



# The RL01 Chucker-type CNC Lathe

Featuring small-diameter (up to 10mm), high-precision machining, compact construction and offering labour savings through auto-loading.

The RL01 is a compact chucker-type CNC lathe for machining small parts, designed to save space and lower costs by incorporating Citizen's precision machining technology; developed and honed by producing wristwatch parts over many years. The machine is ideally suited to slitting, drilling, tapping and also to finishing operations such as chamfering, deburring and burnishing. The machine equipped with a standard loading device takes up only 1.0 m<sup>2</sup> of floor space. Its unique design allows for simultaneous loading of an unmachined workpiece and unloading of a machined workpiece, reducing idle time to a minimum and making substantial cycle-time reductions possible.

Different loading devices can be selected to meet the particular needs of a customer. A part feeder ensures high speed automatic loading of unmachined workpieces to the machine. Also available are a slanted chute-type loading device, a magazine-type loading device (useful for part lot management in mass production), and a manual loading method to supply workpieces one at a time.

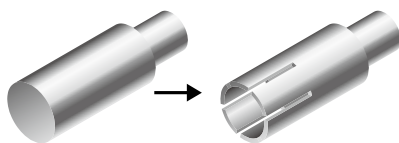


## Ideal for Secondary and Finish Machining

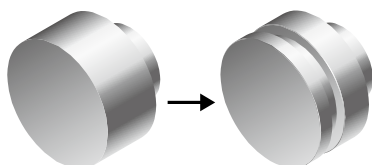
The RL01 is best suited to the secondary and finish machining of forged, diecast or pre-machined workpieces.

### Examples

Drilling + Slitting  
[Machining order]  
Drilling → Chamfering of drilled hole → Slitting



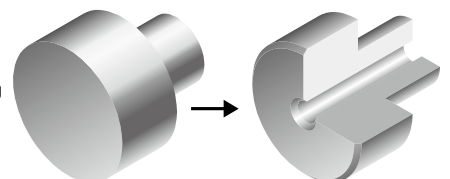
Chamfering + Grooving  
[Machining order]  
Chamfering → Grooving



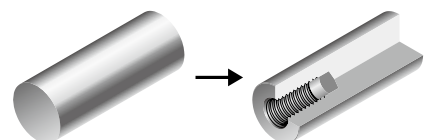
Before Machining

After Machining

Drilling + Chamfering  
[Machining order]  
Centering → Drilling → Front turning



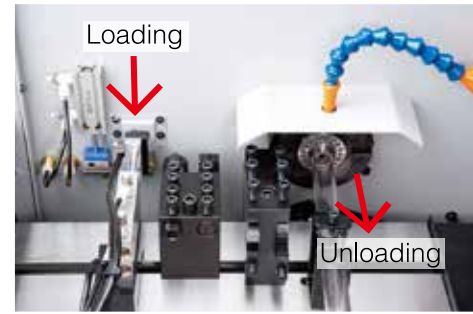
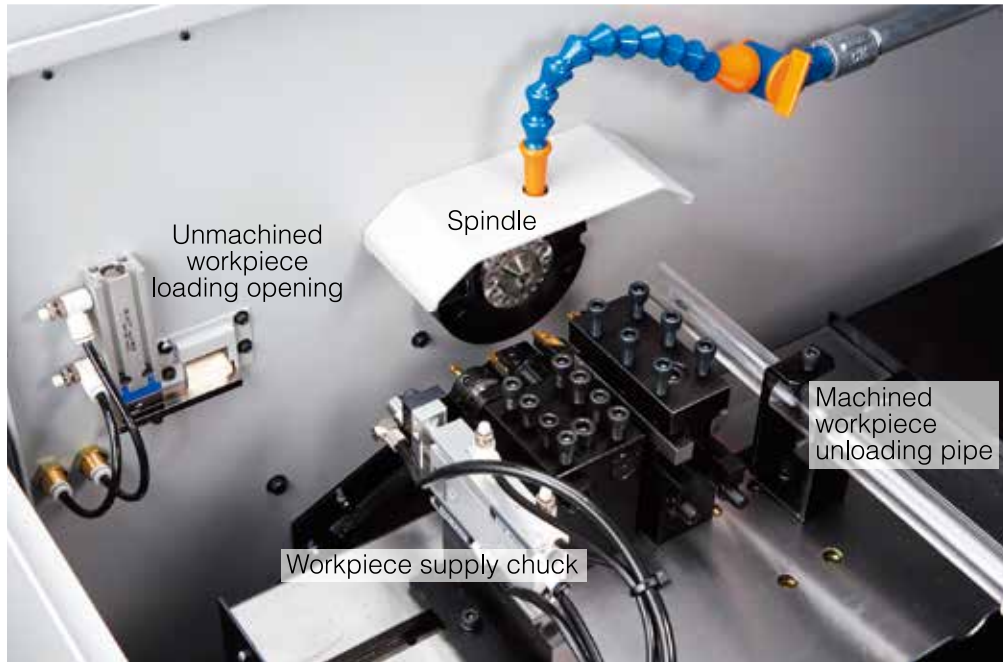
Tapping  
[Machining order]  
Centering → Drilling → Tapping



Before Machining

After Machining

# Machine Configuration



**Simultaneous loading and unloading**  
 Simultaneous loading of an unmachined work-piece and unloading of a machined workpiece ensures substantial reduction of idle time. Loading / unloading time is approximately 4.5 seconds when a vacuum chuck is used as the workpiece supply chuck and approximately 6 seconds when a mechanical chuck is used.

## Easy to use work area

The spindle is equipped with a collet chuck (pull type) as a standard chuck. If part length accuracy is important, the optional collet chuck (fixed type) is available. Ample space in the work area supports good operability and ensures excellent working convenience in tool changing and other tasks. The ample space in the work area permits easy fitment of customized accessories or options.

## Loading devices to suit a wide variety of workpiece shapes

A part feeder automatically lines up workpieces to supply them to the machine. In addition to the part feeder, various types of workpiece loading device are available, allowing selection of the type best suited to the shape of the workpieces to be handled.

Standard specification (CCW operation) with air cylinder



CW spec



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## Optional Accessories and Example Customer Specifications



**Spindle 15° indexing device**  
 (option, dedicated for Type V)  
 Locks the spindle mechanically in 15-deg. intervals. This option is used for drilling eccentric holes on the end and side faces.



**Drill breakage detector (CS example)**  
 Detects drill breakage by bringing a drill into contact with a sensor. This custom specification is used effectively with small-gauge drills to reduce the production of faulty parts.

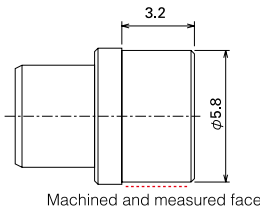


**Tool nose air blower (CS example)**  
 Blows off chips accumulated on tool nose with air. This custom specification is used effectively for boring and drilling tools.

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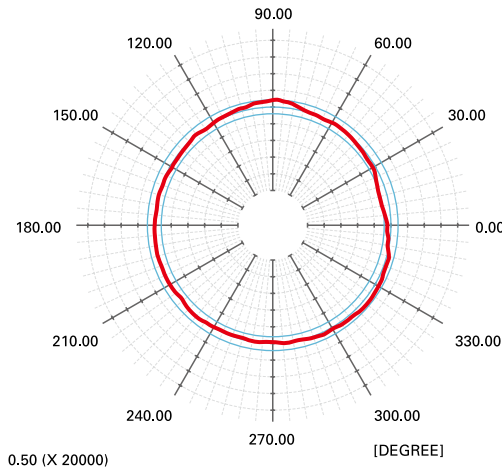
# Example of Machining Accuracy

■ Measured workpiece

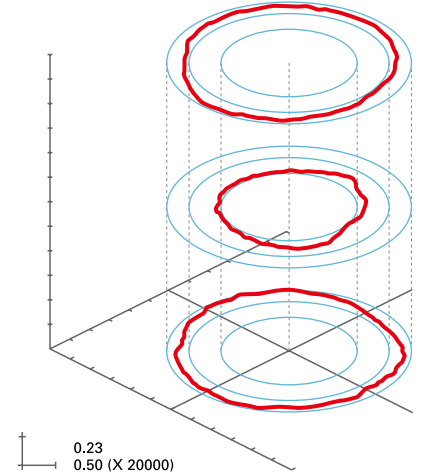


Material: Brass (C3604B)  
Allowance: 0.2 mm (in diameter)

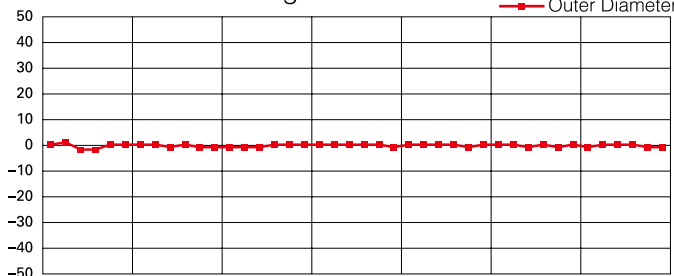
■ Roundness 0.21mm



■ Cylindricity 0.57mm

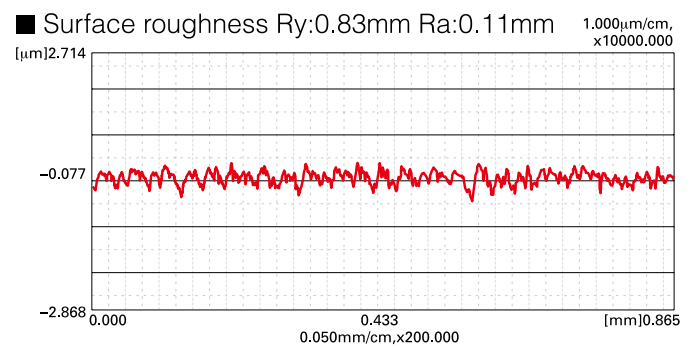


■ Dimensional accuracy (O.D.) in continuous machining 3.0mm



Material: Brass Cycle time: 16 sec Spindle speed: 3000 min<sup>-1</sup>

■ Surface roughness Ry:0.83mm Ra:0.11mm



Although the values above are the results of measurement, they are not guaranteed.

## CW specification



The standard specification part feeder is equipped with an air cylinder for CW operation and ensures a stable supply of unmachined workpieces. The CW specification part feeder is available to handle long workpieces.

## Slanted chute type



## Manual supply



Installing a magazine on the slanted chute enables workpiece supply in lots, appropriate for mass-production part management. Manual loading of workpieces is possible for small-lot production.



**Collet chuck, dead-length type (option)**  
For use when high accuracy in the longitudinal dimension is required. This option ensures stability during front turning operations.



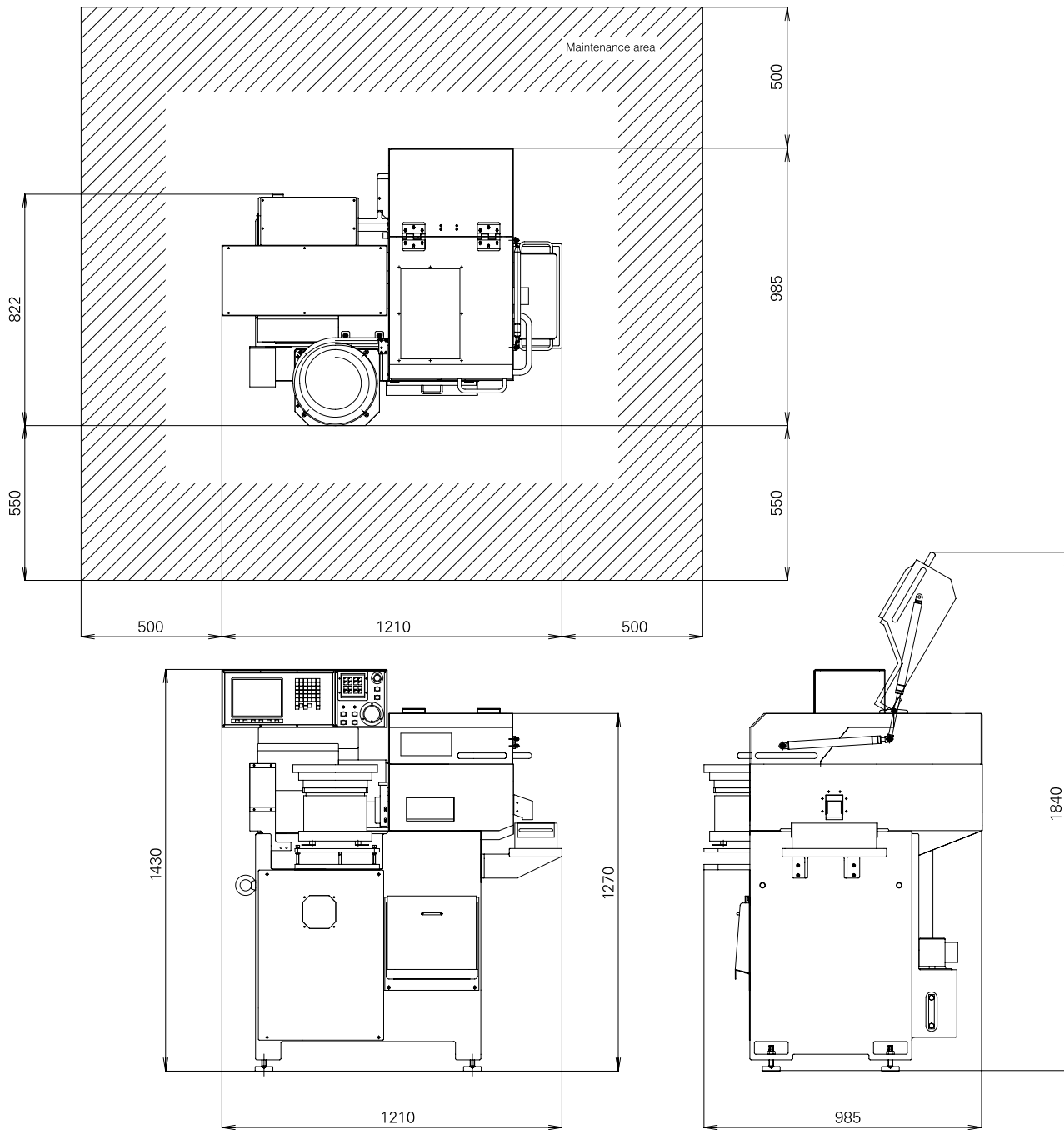
**Medium-pressure coolant device (option)**  
Supplies coolant at an increased pressure using a trochoid pump. This option is effective for removing chips and ensures stable cutting.



**Single and 3-color signal tower (option)**  
Shows the status of the machine.

# Machine Layout

RL01 standard machine



## Points

### General points and points relating to machining

If a coolant that contains chlorine is used the warranty period may not be applicable. If using a coolant that contains chlorine, consult Citizen.

### Points relating to the supply and lining up of workpieces

Fats, oils, soiling, chips or other material adhering to workpieces being supplied by a part feeder or other mechanism can cause blockages or trouble. Be sure to consult Citizen if dealing with workpieces that are charged with static electricity or are magnetic.

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# Machine Specifications

Items	RL01 III	RL01 V	NC unit	FANUC FS0i-MODEL C
Maximum machining diameter (D)	10mm Dia. *		Display unit	8.4-inch / Color LCD
Maximum machining length (L)	50mm		Number of controllable axes	2 axes
Maximum front drilling diameter	5mm Dia.(brass)	6mm Dia. (brass)	Command input method	Absolute / Incremental
Maximum front tapping diameter	M5 (brass)	M6 (brass)	Feed command method	Feed per minute
Main spindle speed	360~6,000min <sup>-1</sup>			Feed per minute / Feed per revolution (Selectable by G code)
Main spindle chuck	Collet chuck (pull type)		Zero point return function	Manual zero point return
	Collet chuck (fixed type)		Background edit function	Standard
	3 inch air chuck (OP)		Program storage capacity	640m 256kbyte
Number of tools to be mounted			Operating time display function	Standard
Tool	4 (as standard)		Self-diagnostic function	Standard
Tool size			Alarm history display function	Standard
Tool	10×10×100mm		Earth leakage breaker	Standard
Sleeve	16mm Dia.			
Rapid feed rate			Standard accessories	
X axis	15m/min		Air knock-out device	Coolant tank (35l)
Y axis	15m/min		Tool post (2 tools) Wedge-adjustment type	Product receiver box
Least input increment			Supply escape cylinder	
X axis	0.001mm			
Y axis	0.001mm		Special Accessories	
Tool post stroke			Various part feeder	Machine light
X axis	170mm		Signal lamp	Fire extinguisher
Y axis	80mm		3-color signal tower	Spindle index device (15°:mechanical lock)
Center height	1,050mm		Buzzer	
Swing on table	120mm Dia.			
Motor				
Spindle drive	0.4kW (inverter)			
Axis feed (X, Z)	0.5kW×2	0.55/1.1kW (AC spindle)		
Coolant pump	0.1kW			
Input power	AC200V three-phase			
Input power capacity	4kVA (max. load)			
Air pressure and air flow rate for pneumatic devices	0.5MPa · 50NI/min (max. 180NI/min)			
Machine size	985 (L) × 1210 (W) × 1430 (H) mm			
Weight	700kg			

\*possible to chuck  $\phi$  14 in some situations

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