

PRECISION TSUGAMI

# TSUGAMI

CNC Precision Automatic Lathe

## P013H/P014H P033H/P034H



A machine tool dedicated to fine precision parts  
Correspond to severe dimensional tolerance  
without warm-up operation





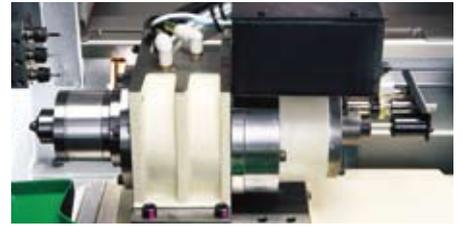
# Turning fine precision parts with diameter of under 0.05 mm at high speed and with high accuracy

## High-speed turning

- 25,000 min<sup>-1</sup> (P013H/P014H) high-speed spindles (main spindle, back spindle)
- 20,000 min<sup>-1</sup> (P033H/P034H)

Turning can be done under the optimum conditions, substantially cutting the turning time for extremely small workpieces.

Clamping and unclamping is possible even during high-speed rotation.



## High-accuracy turning

### ■ Main spindle / back spindle

The main spindle and back spindle have no chuck lever, toggles, or disc springs. Tsugami's unique chuck opening/closing mechanism helps to improve roundness at high spindle speeds.

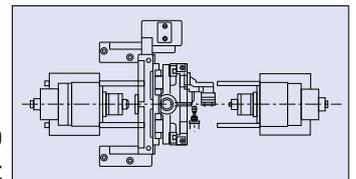
### ■ Air-tube integrated spindle (air piping for the chuck)

Since there is no contact, the mechanism can accommodate high spindle speeds.

The spindle is integrated with a rotary joint.

### ■ High-rigidity base and symmetrical construction

Base with a symmetrical construction to suppress the effects of thermal displacement



### ■ Tool-height displacement compensation

"Tool-height displacement compensation" is a system that automatically applies offsets upon measuring the center height displacement once every few cycles with a touch switch mounted on the slide that moves in the center height direction.

## Improved operating convenience

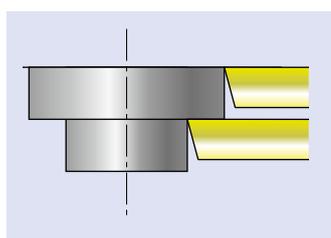
### ■ More convenient operation thanks to chucks with adjustable gripping force (main spindle, back spindle)

The gripping force of the chucks can be adjusted with an air pressure reducing valve. Adjustment of the gripping force is very simple.

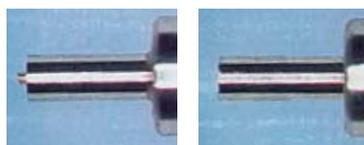
Thin pipe material can also be clamped gently. Force is transmitted directly from an air cylinder to a collet chuck.

### ■ Tool-height compensation function

Simply by entering the actually achieved values for O.D. at two locations after cutting, the center height difference is calculated and is automatically set in the turret data.



HEIGHT Y OFFSET MENU	
1. TOOL No.	= 13
2. LARGE	= 0.95 mm
3. SMALL	= 0.36 mm
CALC	END



Before the offset      After the offset

### ■ Two-spindle cross drilling (optional)

Two-spindle cross drilling is achieved with the servomotor-driven cross drill unit. It enables cutters of up to  $\phi 20$  mm to be used in slitting work.



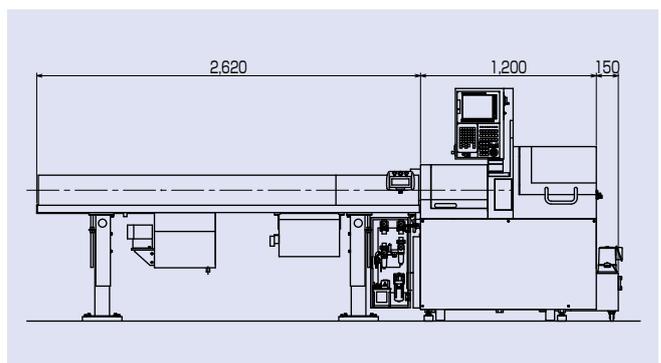
### ■ Dedicated bar feeder "OS1UT" "OS1U-3T"

#### Main characteristics

- (1) Compatible with spindle speeds up to 25,000 min<sup>-1</sup>.
- (2) Quiet operation thanks to use of an oil bath system.
- (3) Delivery force can be adjusted by servomotor feed in accordance with the turning conditions.  
The bar feeder can handle even very small diameter barstock without bending it.

#### Main Specifications

Barstock diameter	$\phi 1.0$ mm / $\phi 3.0$ mm
Barstock length	2,000 mm
Barstock storage capacity	66 $\phi 1.0$ mm bars
Floorspace requirement	2,680 x 550 mm
Weight	200 kg



## Machine specifications

Item		P013H	P014H	P033H	P034H	
Machining range	Working barstock diameter	$\phi 1$ mm		$\phi 3$ mm		
	Max. machining length	When the stationary guide bushing is used 35 mm (Restriction in using work catcher)				
		When the retractable guide bushing is used 30 mm (Restriction in using work catcher)				
Cross drilling chucking dia (Optional)	T04: Brushless motor	$\phi 0.5$ to $\phi 6.0$				
	T05: Servo motor	$\phi 0.5$ to $\phi 7.0$	$\phi 20$ -cutter mountable			
Machine	Main spindle speed	200 to 25,000 min <sup>-1</sup>		200 to 20,000 min <sup>-1</sup>		
	Back spindle speed	—	200 to 25,000 min <sup>-1</sup>	—	200 to 20,000 min <sup>-1</sup>	
	Cross drill speed (Optional)	T04: Brushless motor	5,000 to 50,000 min <sup>-1</sup>			
		T05: Servo motor	200 to 8,000 min <sup>-1</sup>			
	Total tool storage capacity	11	14	11	14	
	Tool size	8 mm x 8 mm x 100 to 120 mm				
	Rapid traverse rate	20 m/min				
Motors	Main spindle	0.75/1.1 kW				
	Back spindle	—	0.75/1.1 kW	—	0.75/1.1 kW	
	X-, Z1-, Z2-axis	0.5 kW				
	Y-axis	0.75 kW				
	Cross drill (Optional)	T04: Brushless motor	0.125 kW			
		T05: Servo motor	0.2 kW			
	Coolant pump	0.1 kW				
	Lubricating pump	3 W				
	Power source, etc.	Net weight	950 kg	1,000 kg	950 kg	1,000 kg
		Power source requirement	7 KVA	9 KVA	7 KVA	9 KVA
Compressed air requirement		0.5 MPa or above				
Air discharge rate		30 NL/min				
Width x depth x height		1,350 x 600 x 1,600 mm				

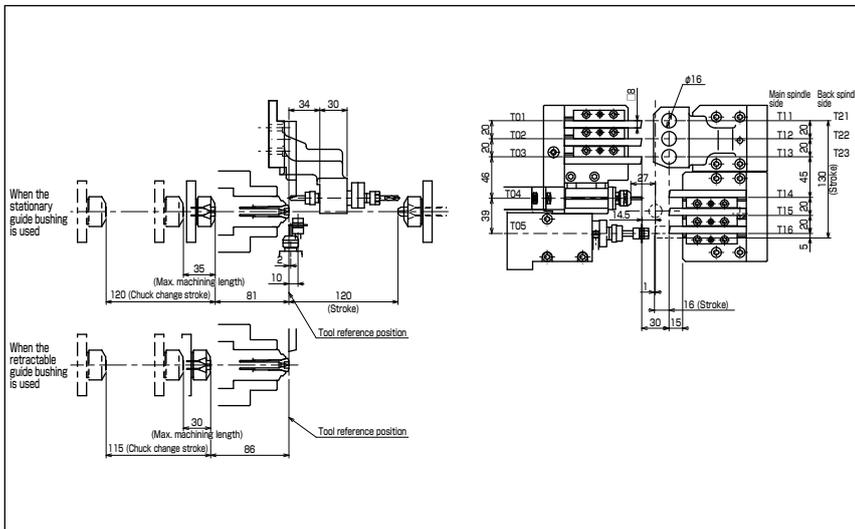
## NC unit (standard specifications)

Item	Specification	
	P013H / P033H	P014H / P034H
NC unit	FANUC 32i-A	
Axis designation	X, Z1, Y	X, Z1, Z2, Y
Least input increment	0.0001 mm (X axis: Diametrical designation)	
Least command increment	0.0001 mm (X axis: 0.00005 mm)	
Max. programmable value	±8 digits	
Interpolation method	Linear/Circular	
Rapid traverse rate	20 m/min	
Feedrate	1 to 6,000 mm/min	
Feedrate override	0 to 150%, 10% step	
Dwell	G04 0 to 99999.999	
Absolute/Incremental command	X, Z, Y: Absolute, U, W: Incremental	
Tool offset value	±6 digits	
Number of tool offsets	32 pairs (sum of main and back spindle NCs)	
Data display	7.2" monochrome LCD	
Display language	English	
Part program storage size	32 Kbytes (in tape length 80 m, sum of main and back spindle NCs)	
Chasing function, Continuous thread cutting, Manual pulse generator, Memory card input/output interface, Background editing, Run time & parts number display, Custom macro, Constant surface speed control, Spindle synchronous control, Tool geometry/wear offset, Chamfering corner R, Expanded program editing, Spindle speed fluctuation detection, Tool nose radius compensation, HRV control		

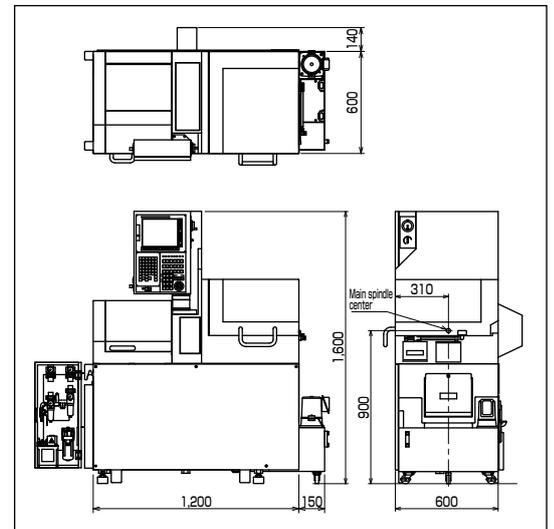
## Package options

Package spec. (Some options below are not included depending on the model.)	
Main spindle and back spindle chuck units	Front work discharge (oil blow)
Guide bushing holder	Work light
Drill holders	HRV control
Double heads drill holder	Bar feeder interface
Fixed spindle liner	Signal tower (triple)
Work catcher	

## Tooling zone



## External View



Export permission by the Japanese Government may be required for exporting our products in accordance with the Foreign Exchange and Foreign Trade Law. Please contact our sales office before exporting our products.

The specifications of this catalogue are subject to change without prior notice.



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