



**JTEKT** Group  
Toyota Machinery Europe

FA-H-J / FA-H-S / FA-H-SX / FA-S SERIES

horizontal machining centres 



## horizontal machining centres



**FH-J Series:**  
FH400J  
FH500J



**FH-S Series:**  
FH450S  
FH550S  
FH630S



**FH-SX Series:**  
FH550SX  
FH630SX  
FH800SX



**FA-S Series:**  
FA630S  
FA800S  
FA1050S



FH1000SX  
FH1250SX





*In trade fairs and open house shows we present our latest developments and technology to our customers.*

*Together with the customer, we develop the most suitable economic and technological manufacturing solution.*

*Our design engineers can make individual modifications to your machine to suit your requirements.*

Investments in high-grade machinery are subject to the requirements of upcoming manufacturing jobs.

In most cases, many different criteria have to be taken into consideration. Among other factors, an optimum configuration of machine type, tool supply, workpiece transfer and control components is important.

Our wide range of horizontal and vertical machining centers allows us to offer manufacturing solutions to our customers which completely meet their requirements.

Customer-specific modifications can be integrated into the general machine concept by our design engineers.

We can perform customer test cutting according to customer's production data or we can develop production data which can utilise the best performance of a chosen product.

Machining accuracy is verified and recorded on a Zeiss coordinate measuring machine, located in our environmentally controlled QC room.

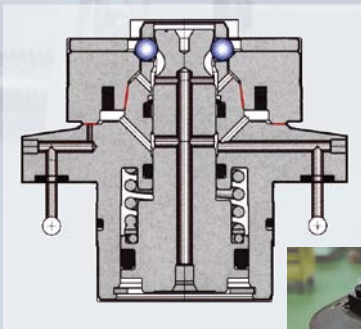
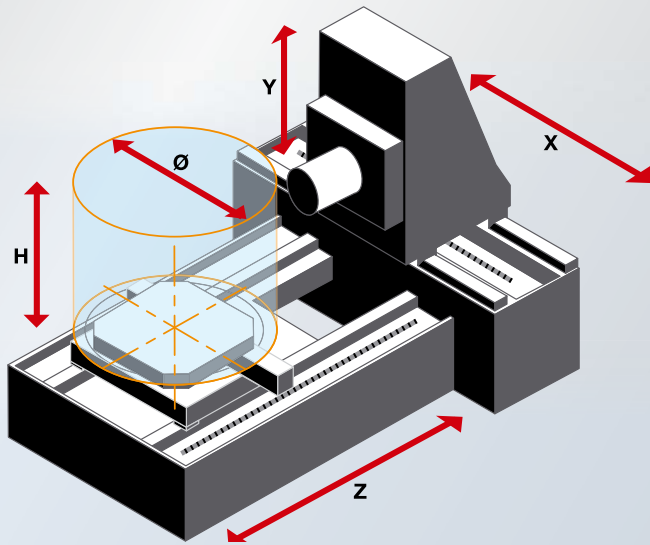
Toyoda attaches great importance to research and development because we want our customers to invest in future-proof technology. As one of the world's leading machine tool manufacturers we want to be innovative, not imitative.



*In the Toyoda technology centre, test cuttings can be performed according to the customer's drawings. The machining result is verified and recorded in an environmentally controlled QC room.*



## horizontal machining centres



Taper-type pallet clamping mechanism



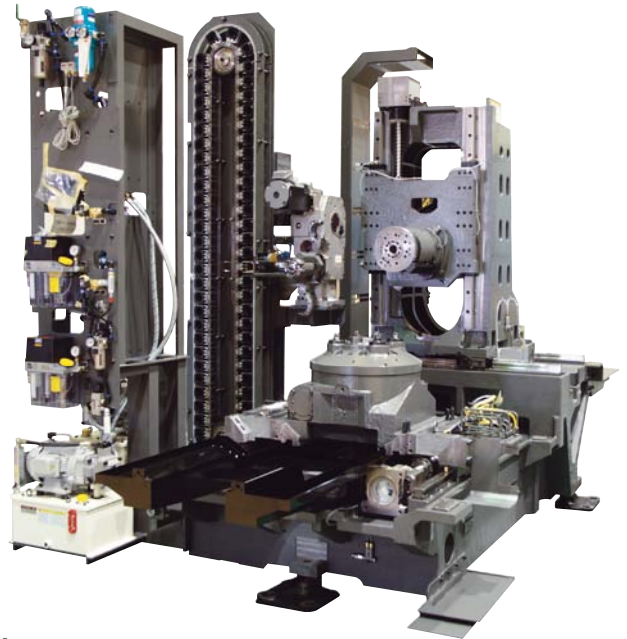
FH-J Series

FH400J

FH500J

### Capacity

Model	FH400J	FH500J
Pallet	400 x 400 mm	500 x 500 mm
Axis stroke X/Y/Z	600 x 560 x 630 mm	730 x 730 x 850 mm
Workpiece (swing diameter x height)	Ø 630 x 900 mm	Ø 800 x 1,000 mm
Max. load on table	400 kg	500 kg



### Machine base

All JTEKT cast components are engineered and manufactured in-house. The design is supported by FEM analyses and provide for an optimum of the components maximising stability at keeping moving masses at a minimum.

### Cast specifications:

- FCD600 (GGG60) cast iron
- 600 N/mm<sup>2</sup> tensile strength

### Pallet changer and table

The clamping of the pallet is done through a specially designed, space-saving mechanism that ensures the stable and precise hold of the pallet.

In order to reduce non-productive times, the FH-J series is equipped with a high-speed pallet table as standard, which is indexing in 0.001°-steps.

The installation of hydraulic pressure supply for automated clamping solutions is possible.

# Technical Data FH-J Series

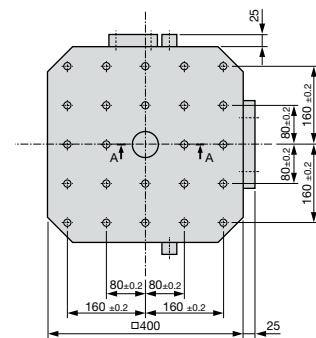
	FH400J	FH500J
<b>Work area</b>		
Axis stroke X (column)	600 mm	730 mm
Axis stroke Y (spindle head)	560 mm	730 mm
Axis stroke Z (table)	630 mm	850 mm
Spindle nose → table center	100 ~ 730 mm	100 ~ 950 mm
Spindle center → pallet surface	50 ~ 610 mm	50 ~ 780 mm
Workpiece (swing diameter x height)	Ø 630 x 900 mm	Ø 800 x 1,000 mm

Spindle		
Spindle speed min <sup>-1</sup>	50 ~ 15,000	50 ~ 15,000
Spindle taper	No.40 (HSK)	No.40 (HSK)
Front bearing Ø (mm)	80	80
Output (kW) 30 min ED / continuous	22/18.5	22/18.5

Automatic tool changer		
Tool holding capacity	60	60
Tool selection	Absolute address	
Max. tool weight	8 kg	8 kg
Max. tool dimensions (Ø x length) mm	Ø 70 x 400 (Ø 140 x 400) <sup>1</sup>	Ø 70 x 400 (Ø 140 x 400) <sup>1</sup>
Tool changing time, tool to tool	0.9s	0.9s
Tool changing time, chip to chip	2.3s	2.3s

<sup>1</sup> without adjacent tools

Dimensions		
Machine height mm	2,750	3,020
Floor space W x D mm	2,100 x 3,750	2,230 x 4,225
Weight	10,000 kg	13,500 kg



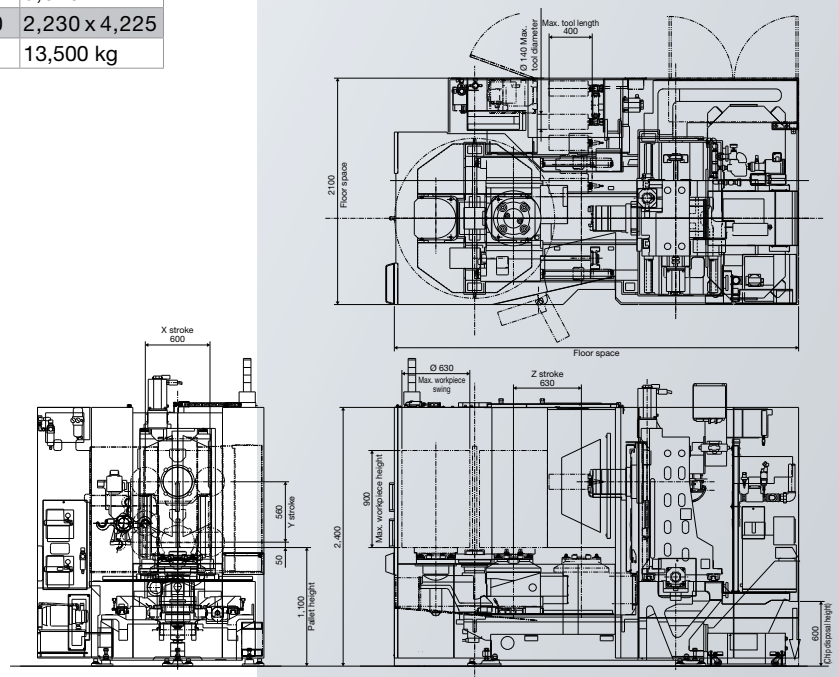
Dimensions 400 mm pallet

	FH400J	FH500J
<b>Pallet changer and table</b>		
Number of pallets	2	2
Dimensions	400 x 400 mm	500 x 500 mm
Indexing angle	0.001°	0.001°
Indexing time, 0~90°	1.6 s	2.0 s
Pallet height from floor	1,100 mm	1,200 mm
Pallet change time	6 s	7 s
Max. load on pallet	400 kg	500 kg

Axis drives		
Rapid traverse rate	60 m/min	60 m/min
Cutting feed rate mm/min	1 ~ 30,000	1 ~ 30,000
Acceleration	X, Z: 1 G, Y: 0.7 G	X, Z: 1 G, Y: 0.7 G
Guides	cylindrical roller slides	cylindrical roller slides
Ballscrew Ø (X, Y, Z)	40 mm	40 mm

Precision		
Positioning accuracy	±0.003 mm	±0.003 mm
Repeatability	±0.0015 mm	±0.0015 mm
Table positioning accuracy	±7 WS	±7 WS
Table repeatability	±3.5 WS	±3 WS

Controller		
	Fanuc 32i	Fanuc 32i



Dimensions FH400J



## Technical data FH-S Series

	FH450S	FH550S (#40)	FH550S (#50)	FH630S (#40)	FH630S (#50)
<b>Automatic tool changer</b>					
<b>Tool holding capacity</b>	Chain: 60 (opt. 120) FTS #40: 360, 560	Chain: 60 (opt. 121) FTS #40: 360, 560	FTS #50: 210, 330, 450, 570	Chain: 60 (opt. 121) FTS #40: 360, 560	FTS #50: 210, 330, 450, 570
<b>Tool selection</b>	Absolute address	Absolute address	Absolute address	Absolute address	Absolute address
<b>Max. tool weight</b>	8 kg	8 kg	27 kg (#50)	8 kg	27 kg (#50)
<b>Max. tool dimensions (Ø x length) mm</b>	Ø70 x 350	Ø75 x 470	Ø120 x 470	Ø75 x 470	Ø120 x 470
<b>Tool changing time, tool to tool</b>	1.3 s (< 8kg)	1.6 s (< 8kg) 1.9 s (< 14 kg)	2.4 s (< 15 kg) 2.7 s (< 27 kg)	1.6 s (< 8 kg) 1.9 s (< 14 kg)	2.4 s (< 15 kg) 2.7 s (< 27 kg)
<b>Tool changing time, chip to chip</b>	2.7 s (< 8kg)	2.7 s (< 8 kg) 3.0 s (< 14 kg)	3.6 s (< 15 kg) 3.9 s (< 27 kg)	2.7 s (< 8 kg) 3.0 s (< 14 kg)	3.6 s (< 15 kg) 3.9 s (< 27 kg)
<b>Precision</b>					
<b>Positioning accuracy</b>	±0.003 mm	±0.003 mm		±0.003 mm	
<b>Repeatability</b>	±0.0015 mm	±0.0015 mm		±0.0015 mm	
<b>Table positioning accuracy</b>	±3 WS	±3 WS		±3 WS	
<b>Table repeatability</b>	±3 WS	±3 WS		±3 WS	
<b>Control</b>					
	Fanuc 31i	Fanuc 31i		Fanuc 31i	
<b>Dimensions</b>					
<b>Machine height</b>	2,785 mm	3,108 mm		3,108 mm	
<b>Floor space W x D</b>	2,500 x 5,363 mm	3,044 x 5,675 mm		3,308 x 6,020 mm	
<b>Weight</b>	11,500 kg	16,000 kg		18,000 kg	
<b>Work area</b>					
<b>Axis stroke X (column)</b>	600 mm	750 mm		1,000 mm	
<b>Axis stroke Y (spindle head)</b>	600 mm	800 mm		800 mm	
<b>Axis stroke Z (table)</b>	600 mm	850 mm		850 mm	
<b>Spindle nose → table center</b>	125 ~ 725 mm	150 ~ 1,000 mm		200 ~ 1,050 mm	
<b>Spindle nose → pallet surface</b>	50 ~ 650 mm	100 ~ 900 mm		100 ~ 900 mm	
<b>Workpiece (swing diameter x height)</b>	Ø630 x 750 mm	Ø850 x 1,000 mm		Ø1,000 x 1,000 mm	
<b>Pallet changer and table</b>					
<b>Number of pallets</b>	2	2		2	
<b>Dimensions</b>	450 x 450 mm	550 x 550 mm		630 x 630 mm	
<b>Indexing angle</b>	NC-table: 0.001°	NC-table: 0.001°		NC-table: 0.001°	
<b>Indexing time, 0~90°</b>	2.5 s	2.0 s		2.0 s (800 kg) / 2.4 s (1,000 kg)	
<b>Pallet height from floor</b>	1,100 mm	1,200 mm		1,200 mm	
<b>Pallet change time</b>	5.6 s	9.5 s		12.0 s	
<b>Max. load on pallet</b>	400 kg	800 kg		800 kg / opt. 1,000 kg	
<b>Spindle</b>					
<b>Spindle speed</b>	15,000min <sup>-1</sup>	15,000min <sup>-1</sup>		15,000min <sup>-1</sup>	
<b>Spindle speed (option)</b>	50 ~ 20,000min <sup>-1</sup>	50 ~ 20,000min <sup>-1</sup> (HSK-A63 only)		50 ~ 20,000min <sup>-1</sup> (SK-A63 only)	
<b>Spindle taper</b>	Taper 40 (DIN, BT)	Taper 40 (DIN, BT)	Taper 50 (DIN, BT)	Taper 40 (DIN, BT)	Taper 50 (DIN, BT)
<b>Spindle taper (option)</b>	HSK-A63	HSK-A63	HSK-A100	HSK-A63	HSK-A100
<b>Front bearing Ø (mm)</b>	Ø80 mm	Ø80 mm	Ø90 mm	Ø80 mm	Ø90 mm
<b>Output (kW) 6,000 min<sup>-1</sup></b>	22.0/18.5 kW	22.0/18.5 kW		22.0/18.5 kW	
<b>Axis drives</b>					
<b>Rapid traverse rate</b>	50 m/min	60 m/min		60 m/min	
<b>Cutting feed rate</b>	1 ~ 30,000 mm/min	1 ~ 30,000 mm/min		1 ~ 30,000 mm/min	
<b>Acceleration</b>	X, Y, Z: (0.7G)	X, Y, Z: (1G)		X, Y, Z: (1G)	
<b>Guides</b>	Cylindrical roller slides	Cylindrical roller slides		Cylindrical roller slides	
<b>Ballscrew</b>	Ø45 mm, Ø36 (Z)	Ø45 mm		Ø45 mm	

## Workspace



The compact machine configuration makes efficient use of the occupied floor space. Yet the work area remains spacious due to the intelligent arrangement of components.

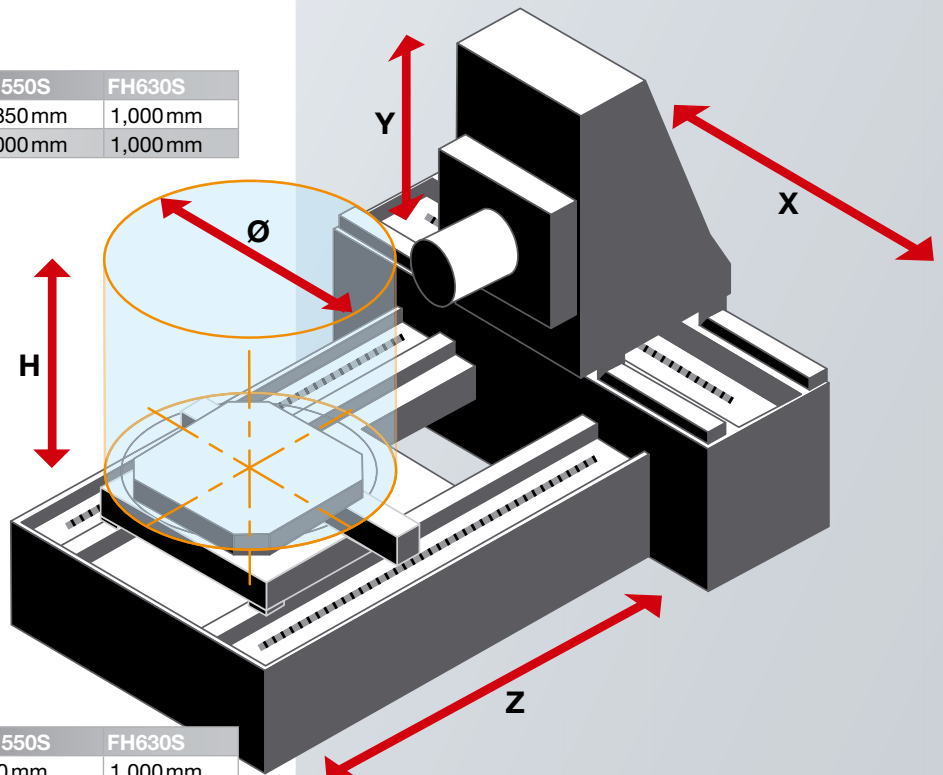
### Center Through

The FH-S Series machines feature dual synchronised ballscrews on the Z-axis, positioned at a large distance from each other.

The ballscrews, linear guides and optional linear scales are all located outside the machining area.

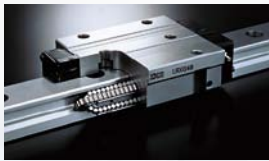
Chips do not fall upon the machine components, but directly into the chip conveyor under the spindle. This avoids troublesome disposal of chips accumulated in the machine. Since the coolant is immediately collected into a tank, the Z-axis feed mechanism and machine bed are not affected by the heat from coolant and chips.

Work piece	FH450S	FH550S	FH630S
Diameter (Ø)	630 mm	850 mm	1,000 mm
Height (H)	750 mm	1,000 mm	1,000 mm



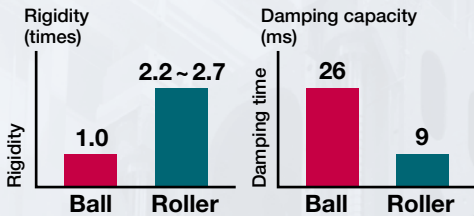
Strokes	FH450S	FH550S	FH630S
X (column)	600 mm	750 mm	1,000 mm
Y (spindle head)	600 mm	800 mm	800 mm
Z (table)	600 mm	850 mm	850 mm

# Guides, drives, spindles



### High-dynamic roller bearing guides:

- Faster damping
- More stability



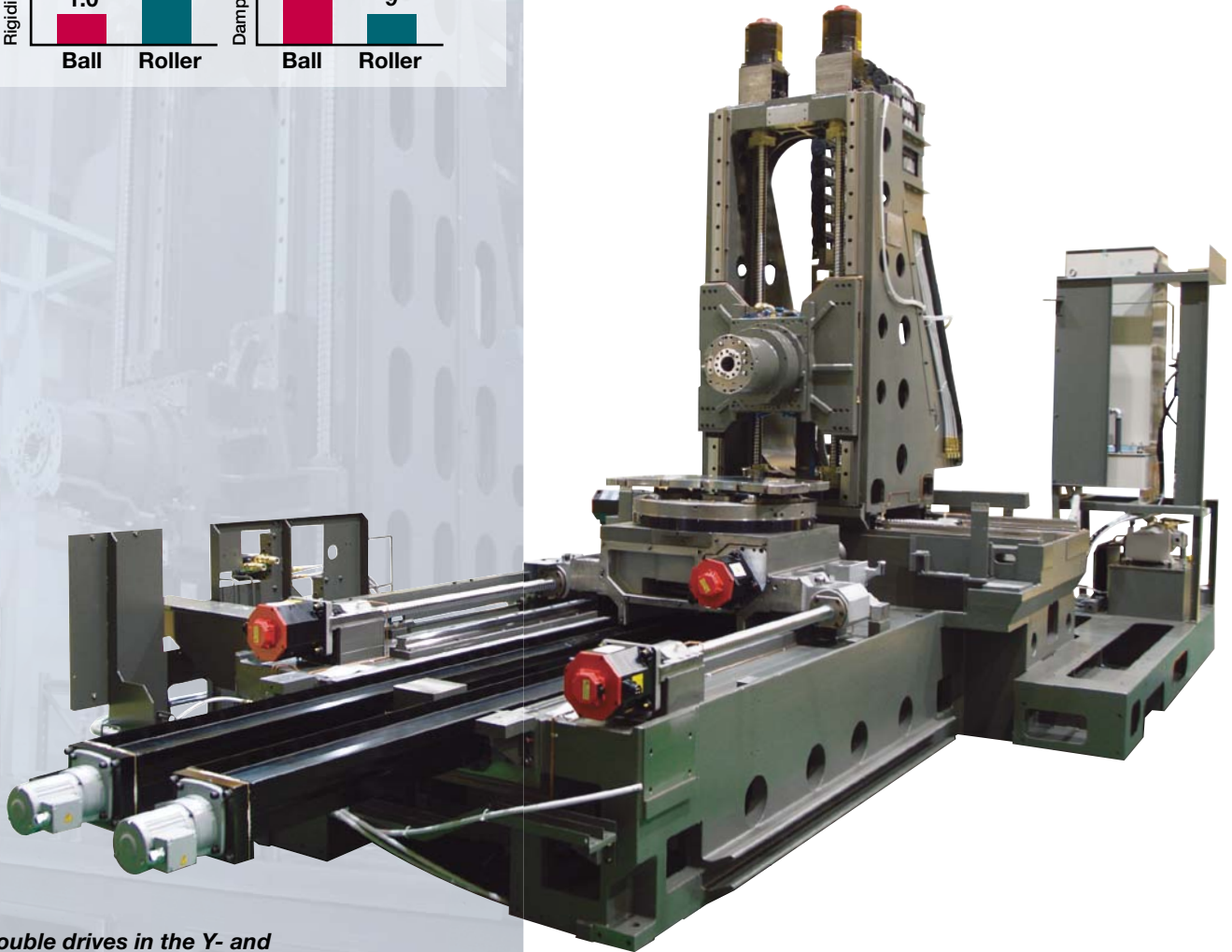
## Guides and drives

Equipped with high-dynamic roller bearing guides

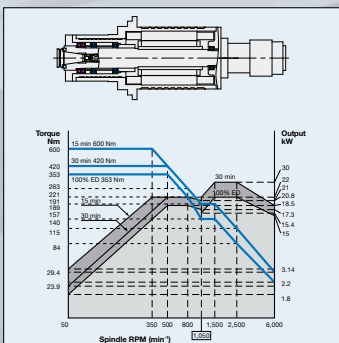
- Excellent damping qualities
- Up to three times better damping than ball bearing type

Axis drives with greater ballscrew diameters and optional direct measurement system

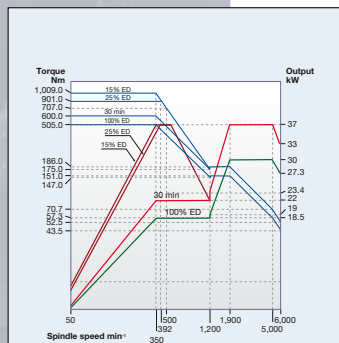
- Double drives for Y- and Z-Axis
- Up to 60 m/min rapid traverse rate (FH1000SX: 54 m/min)



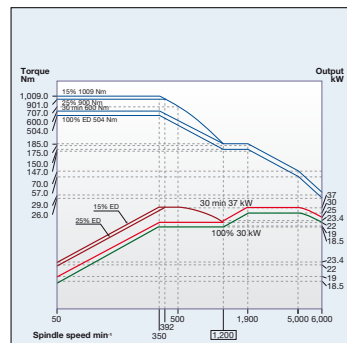
Double drives in the Y- and Z-axis provide highest precision and rigidity  
(Picture: Bed FH800SX)



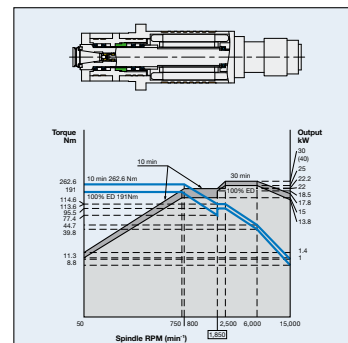
6,000 min<sup>-1</sup> spindle (standard)



6,000 min<sup>-1</sup> high torque spindle with 1,009Nm **OPTION**



8,000 min<sup>-1</sup> high torque spindle with 1,009Nm **OPTION (FH1000SX)**



15,000 min<sup>-1</sup> high speed spindle **OPTION**



## Technical data FH-SX Series

	FH550SX	FH630SX	FH800SX	FH1000SX	FH1250SX
<b>Automatic tool changer</b>					
<b>Tool holding capacity (chain)</b>	60 (optional 121)	60 (optional 121)	60 (optional 121)	60 (optional 121)	60 (optional 121)
<b>~ (magazine)</b>	210, 330, 450, 570	210, 330, 450, 570	210, 330, 450, 570	210, 330, 450, 570	210, 330, 450, 570
<b>Tool selection</b>	Absolute address	Absolute address	Absolute address	Absolute address	number setting
<b>Max. tool weight</b>	27 kg	27 kg	35 kg	35 kg	35 kg
<b>Max. tool dimensions (Ø x length) mm</b>	Ø120 x 545	Ø120 x 545	Ø120 x 670	Ø120 x 800	Ø120 x 800 (Ø350 x 800) <sup>2</sup>
<b>Tool changing time, tool to tool</b>	2.4–2.7 s	2.4–2.7 s	1.9–2.2–3.2 s	2.7–3.2 s	2.7 s (< 15 kg)
<b>Tool changing time, chip to chip</b>	3.6–3.9 s	3.6–3.9 s	5.5–5.8–6.8 s	4.4–5.0 s	4.0 s (< 15 kg)
					<sup>2</sup> without adjacent tools
<b>Precision</b>					
<b>Positioning accuracy</b>	±0.003 mm	±0.003 mm	±0.003 mm	± 0.003 mm	±0.002 mm
<b>Repeatability</b>	±0.002 mm	±0.002 mm	±0.002 mm	± 0.0015 mm	±0.001 mm
<b>Table positioning accuracy</b>	±3 WS	±3 WS	±3 WS	± 3.5 WS	±7 (±3.5 with NC-encoder)
<b>Table repeatability</b>	±3 WS	±3 WS	±3 WS	± 2 WS	±3.5 (±2 with NC-encoder)
<b>Controller</b>					
	Fanuc 31i	Fanuc 31i	Fanuc 31i	Fanuc 310i	Fanuc 310i
<b>Dimensions</b>					
<b>Machine height</b>	3,200 mm	3,200 mm	3,646 mm	4,051 mm	4,520 mm
<b>Floor space W x D</b>	3,312 x 5,800 mm	3,567 x 6,146 mm	3,704 x 7,584 mm	5,900 x 9,350 mm	6,200 x 9,900 mm
<b>Weight</b>	16,100 kg	20,600 kg	21,000 kg	31,000 kg	48,000 kg
<b>Work area</b>					
<b>Axis stroke X (column)</b>	750 mm	1,000 mm	1,250 mm	1,600 mm	2,200 mm
<b>Axis stroke Y (spindle head)</b>	800 mm	800 mm	1,100 mm	1,400 mm	1,600 mm
<b>Axis stroke Z (table)</b>	850 mm	850 mm	1,050 mm	1,850 mm	1,850 mm
<b>Spindle nose → table center</b>	150 ~ 1,000 mm	200 ~ 1,050 mm	200 ~ 1,250 mm	50 ~ 1,900 mm	200 ~ 2,050 mm
<b>Spindle nose → pallet surface</b>	100 ~ 900 mm	100 ~ 900 mm	100 ~ 1,200	100 ~ 1,500 mm	100 ~ 1,700 mm
<b>Workpiece (swing diameter x height)</b>	Ø 850 x 1,000 mm	Ø 1,000 x 1,000 mm	Ø 1,200 x 1,250 mm	Ø 1,800 x 1,600 mm	Ø 2,400 x 1,800 mm
<b>Pallet changer and table</b>					
<b>Number of pallets</b>	2	2	2	2	2
<b>Dimensions</b>	550 x 550 mm	630 x 630 mm	800 x 800 mm	1,000 x 800 mm	1,250 x 1,250 mm
<b>Indexing angle</b>	1° (NC-table: 0.001°)	1° (NC-Table: 0.001°)	1° (NC-Table: 0.001°)	0.001°	0.001°
<b>Indexing time, 0–90°</b>	2.0 s	2.0 s	2.5 s	4.0 s	5.6 s
<b>Pallet height from floor</b>	1,200 mm	1,200 mm	1,300 mm	1,300 mm	1,500 mm
<b>Pallet change time</b>	9.5 s	12.0 s	18.0 s	70.0 s	85 s
<b>Max. load on pallet</b>	800 kg	800 kg	1,300 kg (NC: 1,000 kg)	3,000 kg	5,000 kg
<b>Spindle</b>					
<b>Spindle speed</b>	6,000 min <sup>-1</sup>	6,000 min <sup>-1</sup>	6,000 min <sup>-1</sup>	6,000 min <sup>-1</sup>	50 ~ 6,000 min <sup>-1</sup>
<b>Spindle speed (option)</b>	50 ~ 15,000 min <sup>-1</sup>	50 ~ 15,000 min <sup>-1</sup>	50 ~ 15,000 min <sup>-1</sup>	50 ~ 8,000 min <sup>-1</sup> 50 ~ 15,000 min <sup>-1</sup>	50 ~ 15,000 min <sup>-1</sup> 50 ~ 8,000 min <sup>-1</sup>
<b>Spindle taper</b>	Taper 50 (DIN, BT)	Taper 50 (DIN, BT)	Taper 50 (DIN, BT)	Taper 50 (DIN, BT)	Taper 50 / HSK-A100
<b>Spindle taper (option)</b>	HSK	HSK	HSK	HSK	
<b>Front bearing Ø (mm)</b>	Ø 110	Ø 110	Ø 110	Ø 110 (Ø 120, Ø 100)	6K: 110 15K: 100 8K: 120
<b>Output (kW) 30 min ED/continuous</b>	30.0/22.0 (6,000 min <sup>-1</sup> )	30.0/22.0 (6,000 min <sup>-1</sup> )	30.0/22.0 (6,000 min <sup>-1</sup> )	30.0/22.0 (6,000 min <sup>-1</sup> )	6K: 30/22 15K: 30/25 8K: 37/30 (high torque)
<b>Axis drives</b>					
<b>Rapid traverse rate</b>	60 m/min	60 m/min	48 m/min	54 m/min	42 m/min
<b>Cutting feed rate</b>	1 ~ 60,000 mm/min	1 ~ 60,000 mm/min	1 ~ 30,000 mm/min	1 ~ 30,000 mm/min	1 ~ 30,000 mm/min
<b>Acceleration</b>	X, Y: 6.86 m/s <sup>2</sup> Z: 9.8 m/s <sup>2</sup>	X, Y: 6.86 m/s <sup>2</sup> Z: 9.8 m/s <sup>2</sup>	X, Y: 4.9 m/s <sup>2</sup> (0.5 G) Z: 6.86 m/s <sup>2</sup> (0.7 G)	X, Y, Z: 4.9 m/s <sup>2</sup> (0.5 G)	0.3 G
<b>Guides</b>	Cylindrical roller slides	Cylindrical roller slides	Cylindrical roller slides	Cylindrical roller slides	cylindrical roller slides
<b>Ballscrew</b>	Ø 45 mm	Ø 45 mm	Ø 45 / Ø 50 mm (Z)	Ø 50 mm	X: 63 mm Y, Z: 50 mm

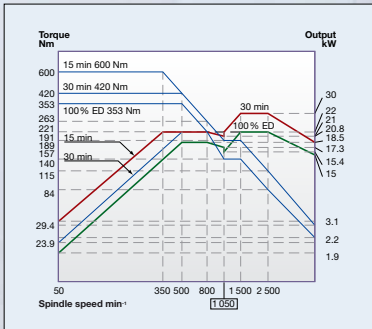
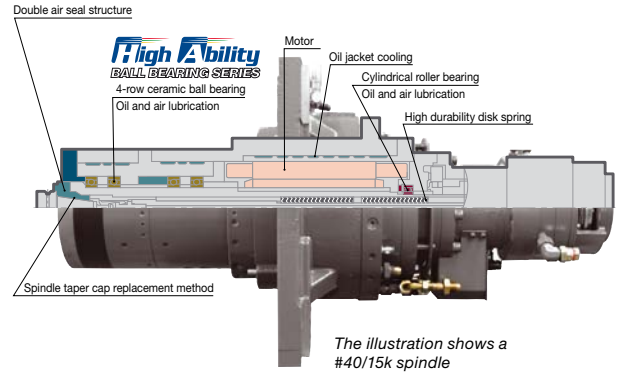
## Guides, drives, spindles

### Spindles

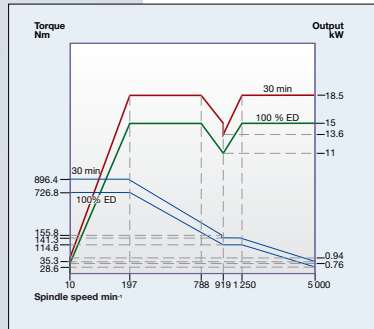
In order to maximise productivity, Toyoda found the perfect balance between speed and stability. The main components have been carefully developed and designed to provide optimum cutting times. Non-productive times have been reduced to a minimum as well.

Powerful spindle specifications, suitable for all applications, with spindle speeds of 5,000, 6,000 and 15,000  $\text{min}^{-1}$  are available.

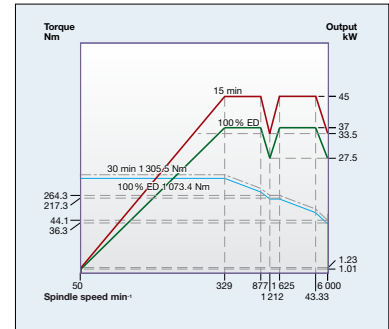
- Taper size #50 (DIN, BT, HSK)
- 6,000  $\text{min}^{-1}$ , 30/22 kW, 600 Nm



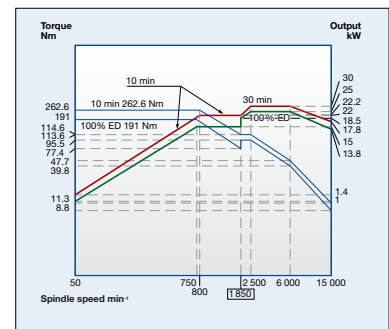
6,000  $\text{min}^{-1}$  spindle (standard)



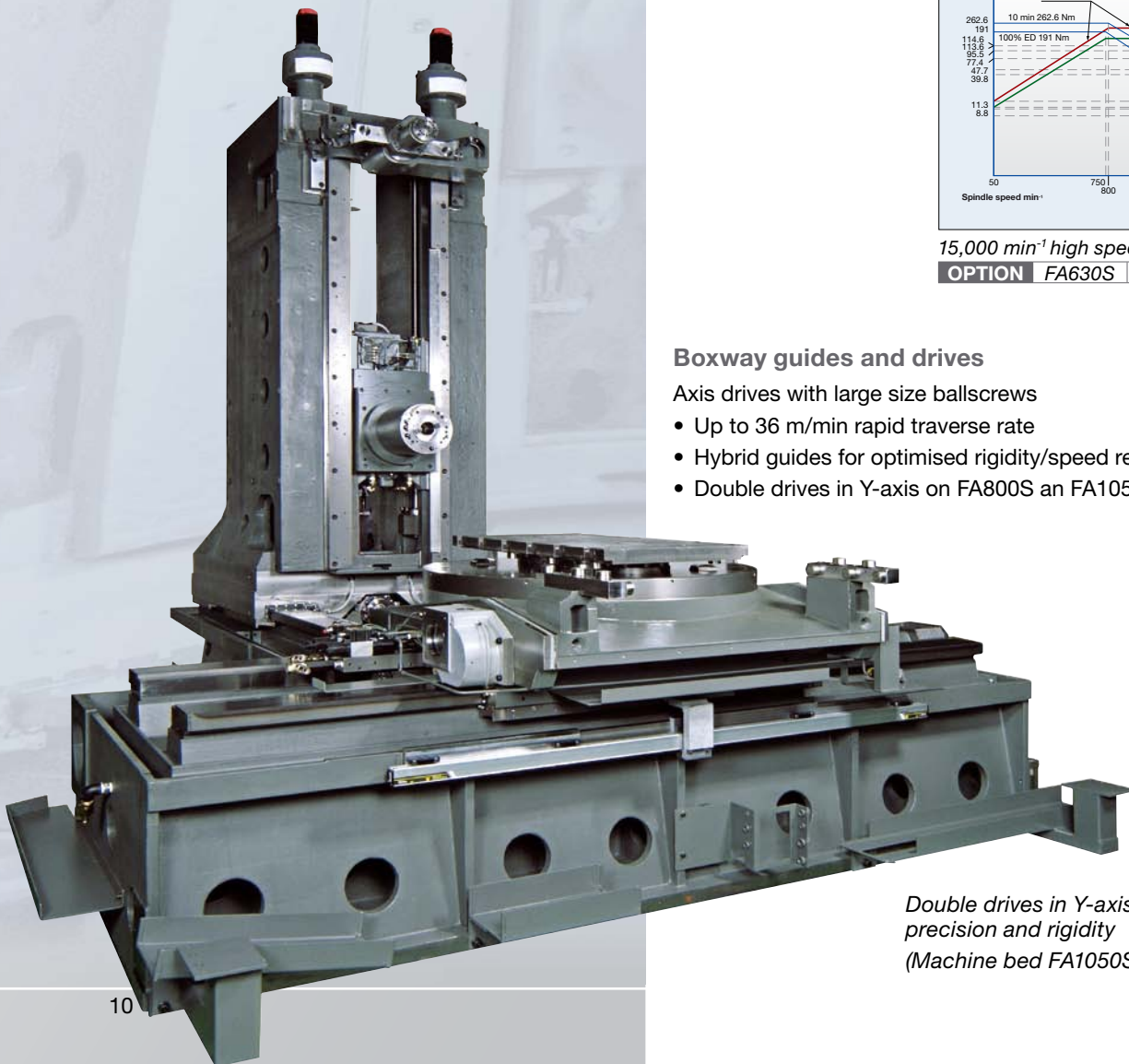
5,000  $\text{min}^{-1}$  high torque gear spindle  
 18.5/15kW **OPTION FA630S**



6,000  $\text{min}^{-1}$  high torque gear spindle  
 45/37kW **OPTION FA800S FA1050S**



15,000  $\text{min}^{-1}$  high speed spindle 30/25kW  
**OPTION FA630S FA800S FA1050S**



### Boxway guides and drives

Axis drives with large size ballscrews

- Up to 36 m/min rapid traverse rate
- Hybrid guides for optimised rigidity/speed relation
- Double drives in Y-axis on FA800S an FA1050S

Double drives in Y-axis for highest precision and rigidity  
 (Machine bed FA1050S)

## Technical data FA-S Series

	FA630S	FA800S	FA1050S
<b>Automatic tool changer</b>			
<b>Tool holding capacity</b>	Chain: 60 (optional 121) FTS: 210, 330, 450, 570	Chain: 60 (optional 121) FTS: 210, 330, 450, 570	Chain: 60 (optional 121) FTS: 210, 330, 450, 570
<b>Tool selection</b>	Absolute address	Absolute address	Absolute address
<b>Max. tool weight</b>	27 kg	35 kg	35 kg
<b>Max. tool dimensions (Ø x length) mm</b>	Ø 120 x 500	Ø 120 x 800	Ø 120 x 800
<b>Tool changing time, tool to tool</b>	2.0s	2.0s	2.0s
<b>Tool changing time, chip to chip</b>	5.5s	7.9s	7.9s

<b>Precision</b>			
<b>Positioning accuracy</b>	±0.003 mm	±0.003 mm	±0.003 mm
<b>Repeatability</b>	±0.0015 mm	±0.0015 mm	±0.0015 mm
<b>Table positioning accuracy</b>	±2 WS	±2 WS	±2 WS
<b>Table repeatability</b>	-	-	-

<b>Control</b>			
	Fanuc 31i	Fanuc 31i	Fanuc 31i

<b>Dimensions</b>			
<b>Machine height</b>	3,561 mm	3,750 mm	4,100 mm
<b>Floor space W x D</b>	3,550 x 6,050 mm	4,225 x 7,400 mm	4,665 x 8,140 mm
<b>Weight</b>	16,000 kg	21,000 kg	30,000 kg

<b>Work area</b>			
<b>Axis stroke X (table)</b>	1,000 mm	1,350 mm	1,600 mm
<b>Axis stroke Y (spindle head)</b>	850 mm	1,150 mm	1,400 mm
<b>Axis stroke Z (column)</b>	750 mm	1,150 mm	1,150 mm
<b>Spindle nose → table center</b>	175 ~ 925 mm	200 ~ 1,350 mm	250 ~ 1,400 mm
<b>Spindle nose → pallet surface</b>	50 ~ 900 mm	50 ~ 1,200 mm	50 ~ 1,400 mm
<b>Workpiece (swing diameter x height)</b>	Ø 1,000 x 1,000 mm	Ø 1,600 x 1,300 mm	Ø 1,850 x 1,550 mm

<b>Pallet changer and table</b>			
<b>Number of pallets</b>	2	2	2
<b>Dimensions</b>	630 x 630 mm	800 x 800 mm	1,050 x 1,050 mm
<b>Indexing angle</b>	NC-table: 0.001°	NC-table: 0.001°	NC-table: 0.001°
<b>Indexing time, 0~90°</b>	2.7 s	5.0 s	5.0 s
<b>Pallet height from floor</b>	1,200 mm	1,300 mm	1,400 mm
<b>Pallet change time</b>	12.0 s	40.0 s	43.0 s
<b>Max. load on pallet</b>	1,300 kg	2,500 kg	3,000 kg

<b>Spindle</b>			
<b>Spindle speed</b>	6,000 min <sup>-1</sup>	6,000 min <sup>-1</sup>	6,000 min <sup>-1</sup>
<b>Spindle speed (option)</b>	50 ~ 15,000 min <sup>-1</sup>	50 ~ 15,000 min <sup>-1</sup>	50 ~ 15,000 min <sup>-1</sup>
<b>Spindle taper</b>	Kegel 50 (DIN, BT)	Kegel 50 (DIN, BT)	Kegel 50 (DIN, BT)
<b>Spindle taper (option)</b>	HSK	HSK	HSK
<b>Front bearing Ø (mm)</b>	Ø 110 mm	Ø 110 mm	Ø 110 mm
<b>Output 15,000 min<sup>-1</sup></b>	30/22 kW	30/22 kW	30/22 kW

<b>Axis drives</b>			
<b>Rapid traverse rate</b>	36 m/min	24 m/min	24 m/min
<b>Cutting feed rate</b>	1 ~ 36,000 mm/min	1 ~ 24,000 mm/min	1 ~ 24,000 mm/min
<b>Guides</b>	Boxway guides	Boxway guides	Boxway guides
<b>Ballscrew diameter (Ø/mm) (X, Y, Z)</b>	50 (X,Y,Z)	63 (X), 50 (Y), 63 (Z)	63 (X), 50 (Y), 63 (Z)



## flexible manufacturing systems

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