ONE! JTEKT

Koyo, TOYODA, and JTEKT
unified all brands into JTEKT.

JTEKT

Horizontal Spindle Machining Centers

FH5000 Series

FH5000S-i
FH5500S-i
FH5500SX-i

Machine tools & FA systems WEB sight

https://toyoda.jtekt.co.jp/e/

JTEKT Overseas Hubs

https://www.jtekt.co.jp/e/company/global.html

JTEKT CORPORATION

https://www.jtekt.co.jp/

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Available machines or machines shown may vary depending on optional equipment or periodic design changes.
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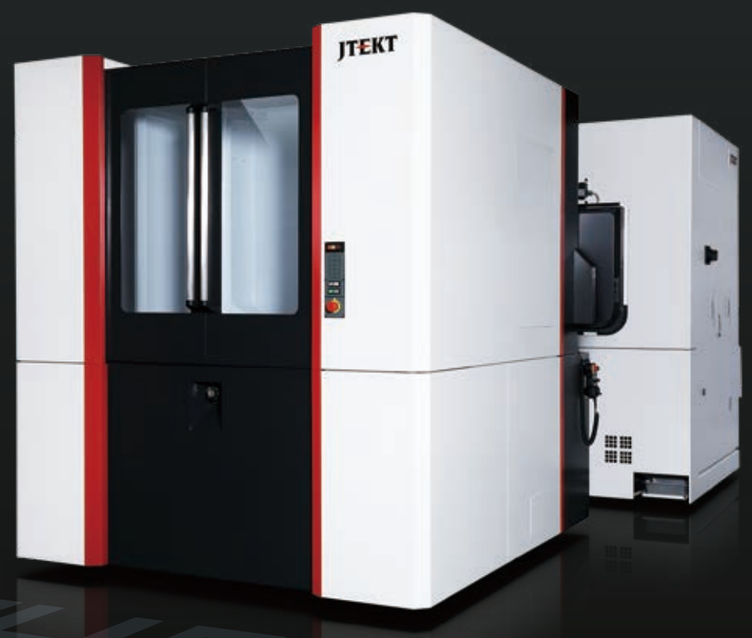
In order to observe laws and regulations and prevent inappropriate export, re-sale and relocation, JTEKT has equipped all of our NC machine tools with devices that detect relocation. If this device is activated, the machine will cease operation and will not restart until it has been checked by JTEKT. JTEKT may refuse to restart the machine should it be deemed that such an action would amount to the inappropriate export of a commodity or technology, or violate export regulations. In such a case, JTEKT will not be liable for any damages arising from the refusal to restart machine operation and do not bear any liability to perform services pertaining to product warranty.
Please contact your JTEKT representative for details. Always read manuals carefully before using any machinery to ensure safe and proper use.

Type of Machinery: Machining Center
Model Number: FH5000 Series

CAT.NO.MA030EN-2TA
'24.03 ('22.03)

CAT.NO.MA030EN-2TA

For all manufac turing demands



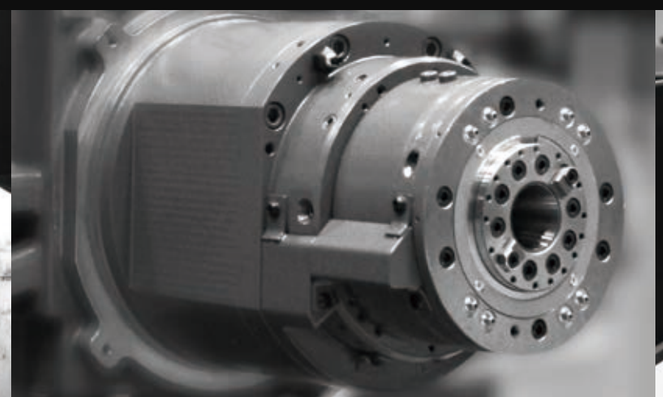
FH5000 SERIES

Now much
easier to use!

Unprecedented productivity × Outstanding quality × Highly customized operability

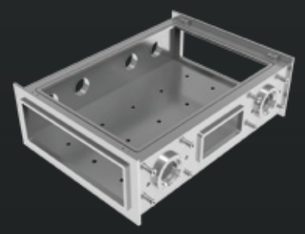
+

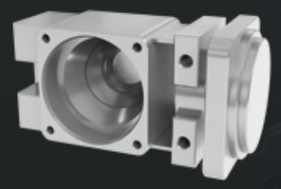
Proven Key Technology



Sample works

FA Equipment / semiconductors



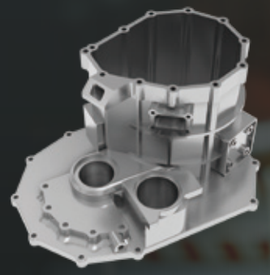


01 Components for semiconductor manufacturing equipment

02 Speed reducer case

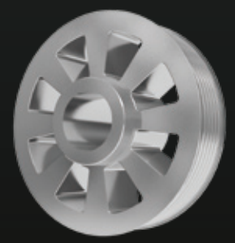
03 Robot arm

Automotive parts



04 Housings

General machines / dies

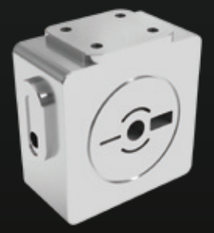


05 Oil pumps

06 Valves

07 Dies

Agriculture / construction / railway / aviation



08 Hydraulic valve

09 Gearbox

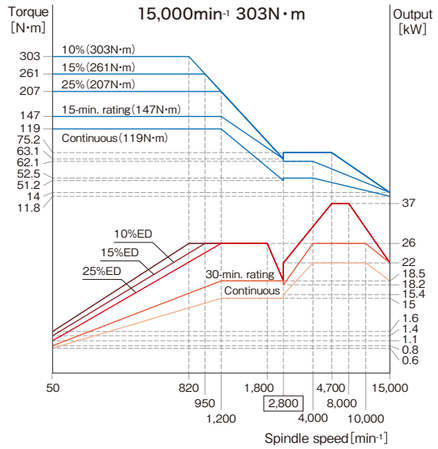
Spindles for all manufacturing demands

Standard #40 spindle
for saving energy and improving productivity

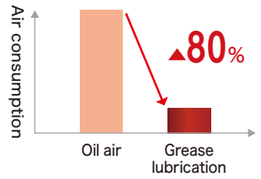
FH5000S-i

[Model]	FH5000S-i
[Spindle nose shape]	BT No.40
[Spindle speed]	15,000min-1
[Max. torque]	303N・m
[Spindle diameter]	ϕ85mm

High-speed, high-rigidity spindle for machining materials with high-speed rotation and feeding.

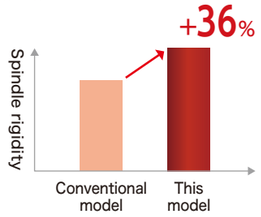


With JTEKT's high-ability bearings, this grease-lubricated spindle achieves 15,000 min-1 (dmn* = 1.61 million). As a result, air consumption has been reduced by 80% compared to our conventional models.



*dmn: A value that represents the rotation performance of a bearing
Pitch circle diameter (mm) × Rotational speed (min-1)

The spindle's rigidity has improved by 36% compared to our previous models, with the bearings located close to the end of the spindle head and the bearing/housing diameter being larger.



The optimally-designed gap/pocket geometry between the bearing's inner ring and cage significantly reduces the temperature rise at high speed rotation and achieves low thermal displacement.

High Ability BALL BEARING SERIES Ceramic ball bearing

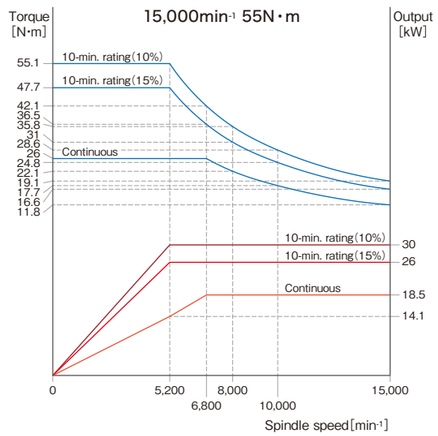
Ultra-high acceleration spindle
for machining aluminum parts

Option FH5000S-i

[Model]	FH5000S-i
[Spindle nose shape]	BT No.40
[Spindle speed]	15,000min-1
[Rigid tap]	6,000min-1

Low-inertia spindle with smaller length and diameter takes only 0.5 seconds for acceleration, making it ideal for machining aluminum parts.

Acceleration 0.5sec
(0→15,000min-1)

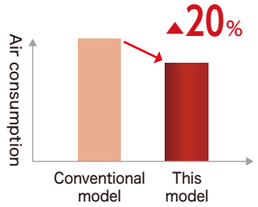


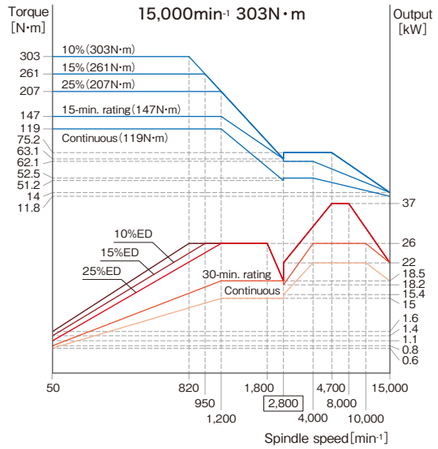
Standard #50 spindle
that can machine a wide range of workpieces

FH5500S-i

[Model]	FH5500S-i
[Spindle nose shape]	BT No.50
[Spindle speed]	15,000min-1
[Max. torque]	303N・m

Multi-purpose spindle (No. 50) that can be used for cutting aluminum parts and iron materials





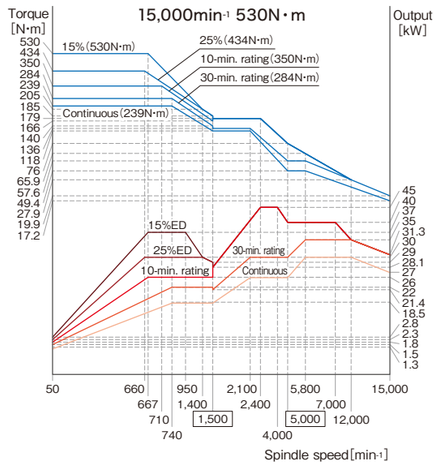
High speed, high-torque spindle
for machining castings and iron parts

FH5500SX-i

[Model]	FH5500SX-i
[Spindle nose shape]	BT No.50
[Spindle speed]	15,000min-1
[Max. torque]	530N・m
[Spindle diameter]	ϕ120mm

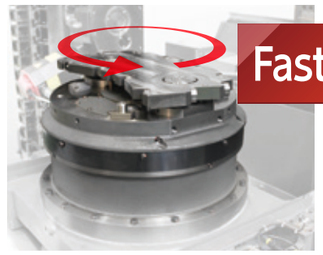
Wide-scope spindle with high rigidity and rotation accuracy that can machine iron materials, which need to be cut at low speed, and difficult-to-cut materials.

Max. torque 530N・m
(15,000min-1)



DD table

DD (Direct Drive) table that is driven directly by a built-in motor. High-precision indexing with zero backlash and equipped with a high-resolution encoder.

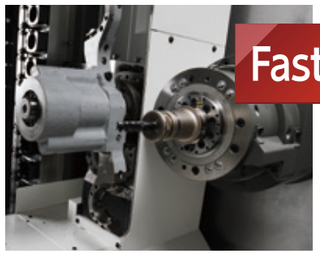


Fastest in the class

90°indexing:
0.7sec (～ 500kg)
Max load on pallet :
1,000kg

Tool change time

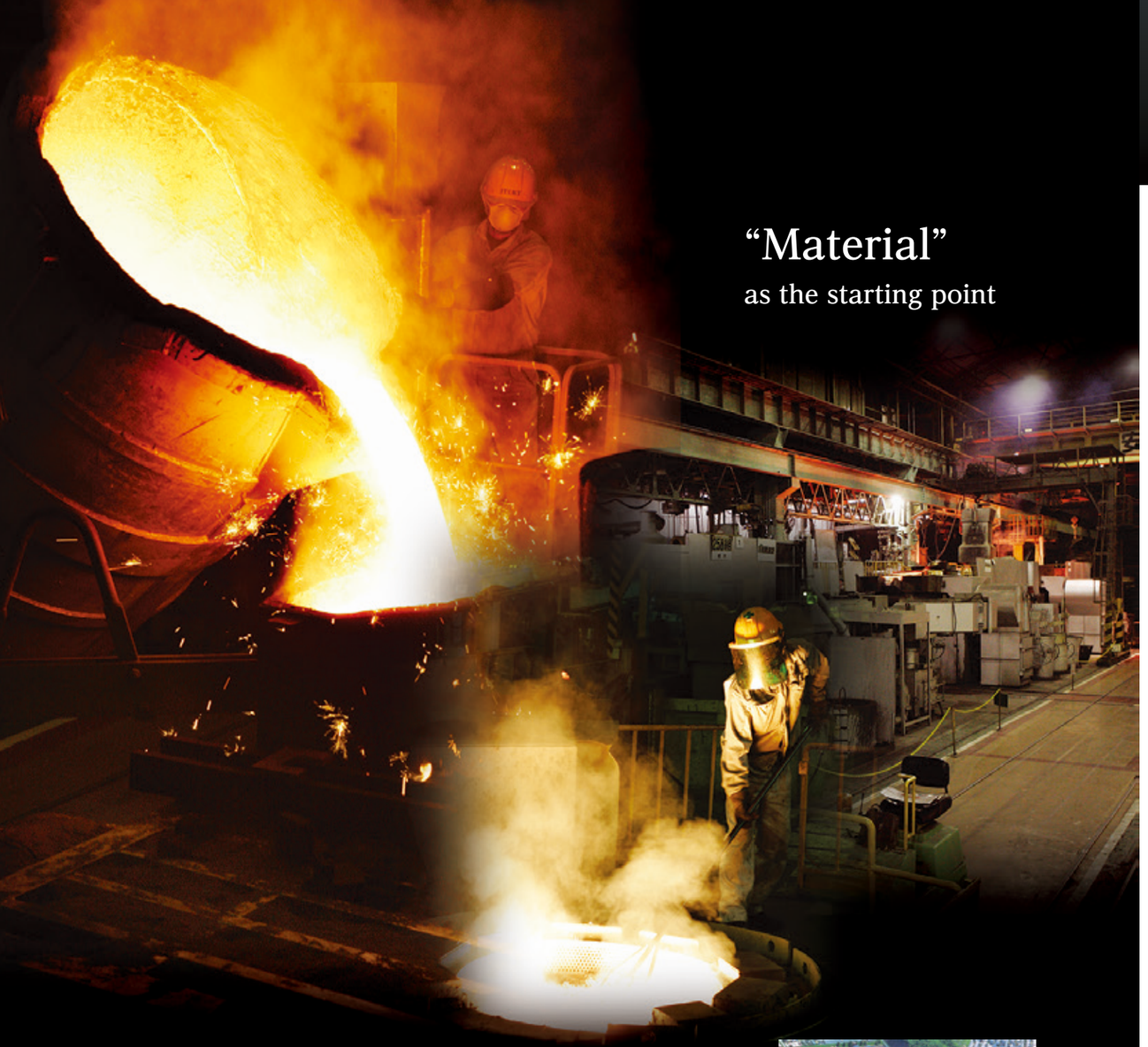
The light-weight ATC achieves 2.4 seconds of Chip to Chip. TOYOPUC-Touch tool information makes it possible to adjust the ATC speed to three levels.



Fastest in the class

Chip to Chip
Up to 2.4 seconds

* Time when FH5000S-i is used.

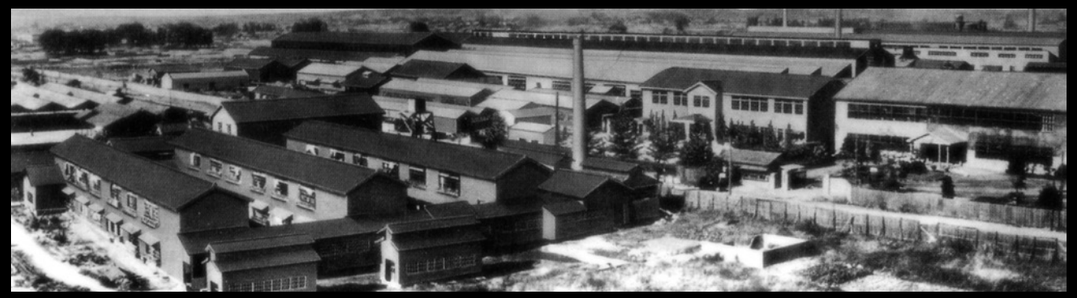


“Material”
as the starting point

Casting technology perfected over time

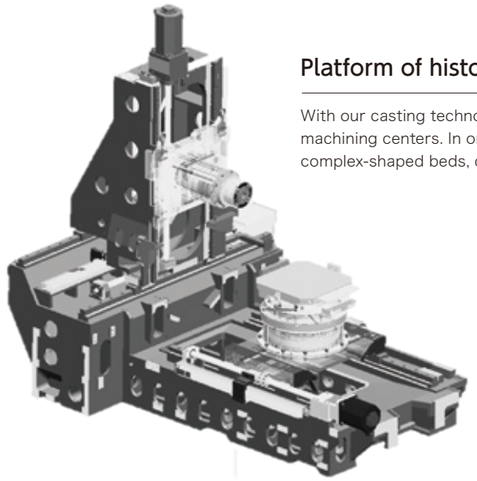
JTEKT (former Toyoda Machine Works) separated from Toyota Motor Corporation in 1941 and has been operation independently since. The casting division was established at the time of company creation, with the objective of supplying cast irons appropriate for the performance of superior machine tools. Casting technology, nurtured and enriched over the years since company establishment, is materialized in the manufacture of high grade machining centers.

Okazaki plant



Kariya plant in 1952

Unprecedented productivity × Outstanding quality × Highly customized operability



Platform of history and innovation

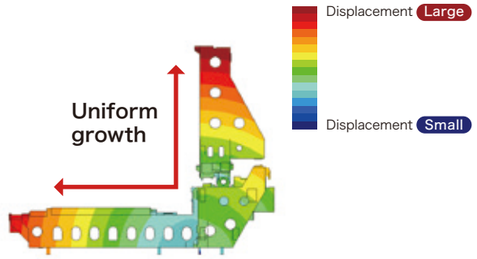
With our casting technology that we have refined throughout our history, we have developed high-quality machining centers. In order to maximize the mechanical performance, we manufacture large and complex-shaped beds, columns and tables in-house.

Rapid feed	60m/min
Acceleration	X : 9.8m/s² (1G) (FH5000S-i / FH5500S-i), 6.86m/s² (0.7G) (FH5500SX-i) Y : 9.8m/s² (1G) (FH5000S-i / FH5500S-i), 6.86m/s² (0.7G) (FH5500SX-i) Z : 6.86m/s² (0.7G)～11.76m/s² (1.2G) (FH5000S-i / FH5500S-i / FH5500SX-i)
Stroke	X-axis : 800mm (FH5000S-i) 900mm (FH5500S-i / FH5500SX-i) Y-axis : 800mm Z-axis : 880mm
Max. workpiece dimension	Diameter : ϕ900mm Height : 1,100mm

Largest in the class

Rigid platform (minimizes YZ right angle change)

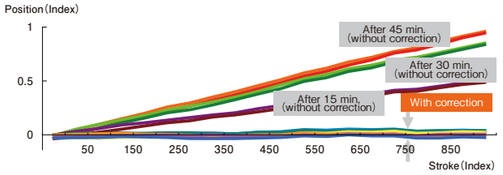
In addition to conventional mechanical design, a further evolved low thermal displacement platform is adopted. Designed with CAE analysis, the heat capacities of the bed and column are optimized, and displacement of the entire machine is reduced even during long-term machining and temperature changes.



BTS (Ballscrew Thermo Stabilizer) function

The BTS function is installed as a standard feature to stabilize the repetitive positioning accuracy when cutting. With the BTS function, the displacement sensor installed at the end of the ball screw measures the elongation of the entire screw, which is distributed into offsets for each stroke position to correct the positioning accuracy. With this function, accuracy can be stabilized without any costly accessories such as linear scales which require maintenance. Furthermore, continuous cutting operation over a long time becomes possible.

Results of ball screw displacement correction after continuous positioning is performed

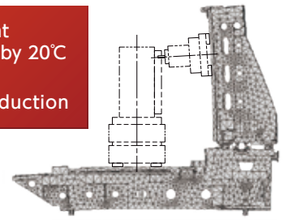


*This is an image of compensation. The values shown are not actual machine values.

Intelligent thermal displacement correction system Option

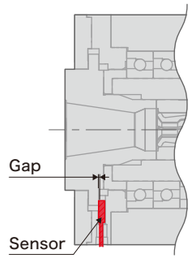
This system creates 3D models of a machine using temperature information sensed from various parts of it. The accuracy can be stabilized by calculating and controlling the position of tool tip displacement in real time. This reduces time-consuming measurement correction and corrective machining.

thermal displacement temperature change by 20℃
▲80% reduction

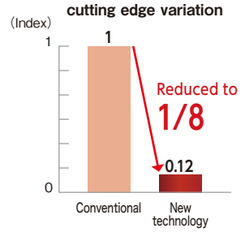


Spindle thermo stabilizer function Option

A displacement sensor installed at the end of the spindle is used to directly detect spindle edge position, which can be easily displaced by heat generated inside the spindle during extended operation. Z-axis direction deviation is suppressed as much as possible in order to accomplish precision cutting.



Amount of cutting edge variation

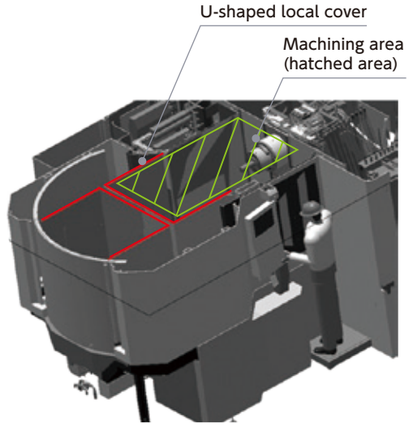


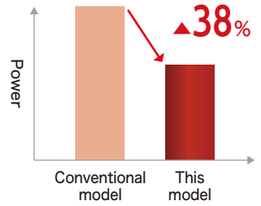
Wide center trough chip discharge

The double center trough structure makes it possible to collect a large amount of chips directly under the machining area of the bed to eliminate shutdown due to chip accumulation. The width of the trough is twice as wide as prior generation.

U-shaped APC cover prevents coolant scattering

By covering the machining area with a U-shaped APC cover to prevent coolant scattering, the amount of coolant used can be the minimum amount required for machining. As a result, the power consumption of the coolant supply pump has been reduced by 38% compared to our conventional systems.





Spindle-through coolant 2MPa

Coolant is supplied through the spindle center to the cutting edge.It is effective for lubrication and cooling of the cutting point, chip disposal and extension of tool life.

Discharge chips on the upper part of the spindle

Cleans the top of the spindle head with two external coolant nozzles in order to prevent chips from being trapped in the spindle taper during tool change.

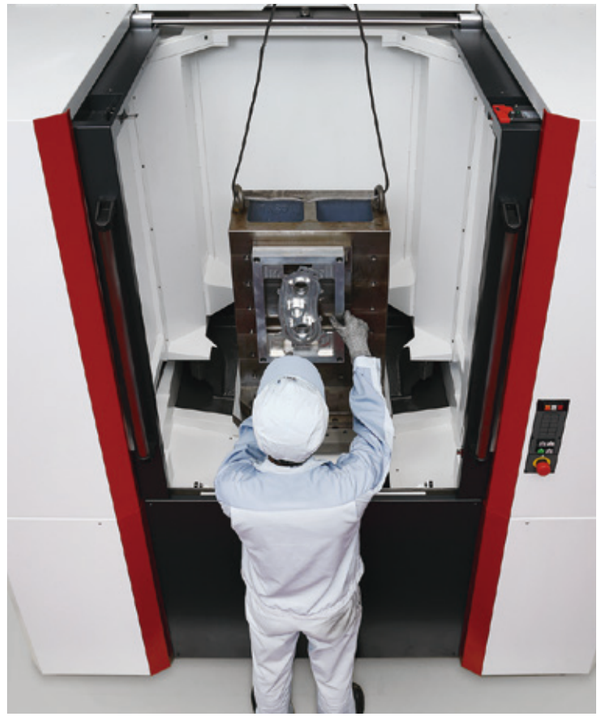
Overhead shower coolant

The coolant nozzle installed in the ceiling discharges coolant, keeping chip accumulation inside the machine down to a minimum.

Unprecedented productivity × Outstanding quality × Highly customized operability

Great maintainability and wide space

It is easy to approach the spindle and table, making it easier to perform visual examinations and use measuring tools, reducing the physical burden on operators. The large opening makes it easier to load fixtures and workpieces with a crane.



TOYOPUC-Touch

–Simple, safe and connectable–

Visualization of equipment status

Displays operation status, NC programs, operation/machining results, periodic inspections, and other various data on the easy-to-see screen, making it possible to work efficiently.

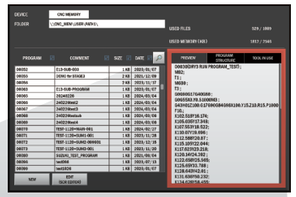
Operation status screen

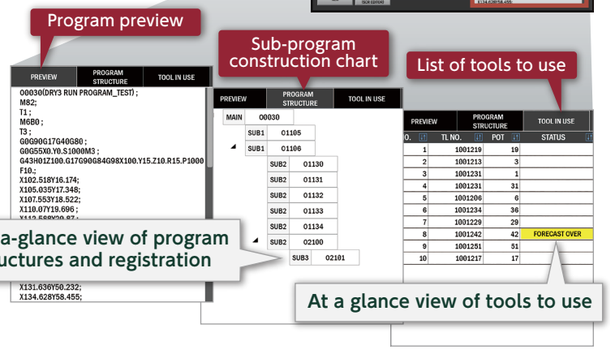
All information has been gathered on the single screen.

feed・spindle **speed and spindle load** status **at a glance**

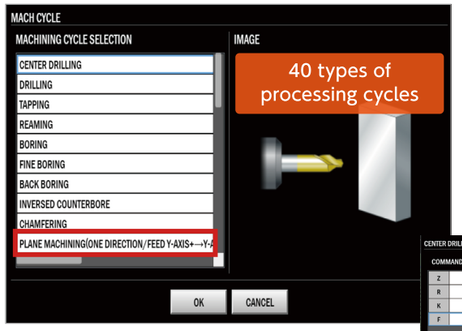
List of NC programs

Displays details and structures of and tools to use for NC programs selected from the program list.



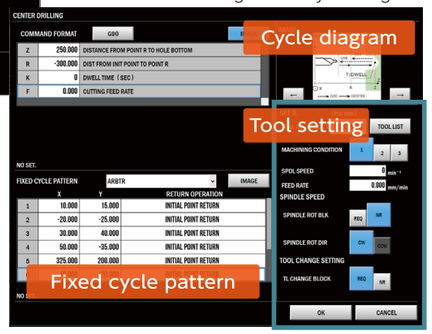


Easy for programming

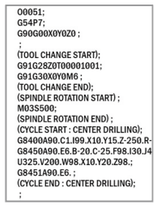


Select cycle while looking at the image

Enter required dimensions while looking at the cycle diagram



Input according to the number of holes, work shape, etc.



Create automatically

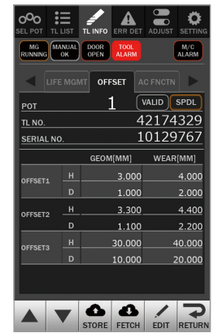
Unprecedented productivity × Outstanding quality × Highly customized operability

Equipped with touch magazine operation panel as standard

You can complete work required for mounting and replacing tools with this panel.

The touch panel enables high-quality operation.

Magazine indexing operation is possible while looking at tool information.



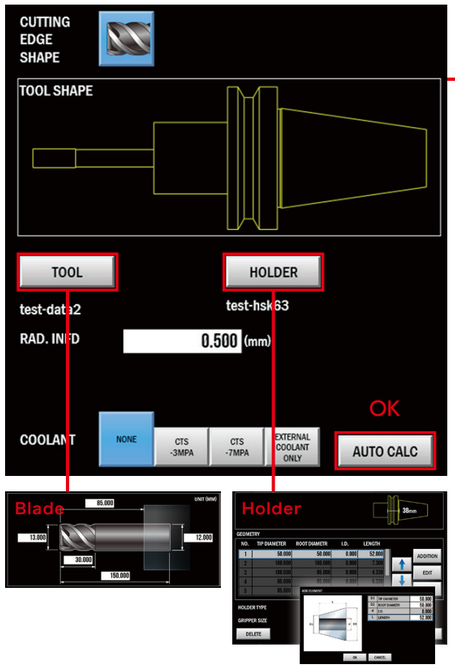
Editing work such as tool life and offset is possible at the tool change position.

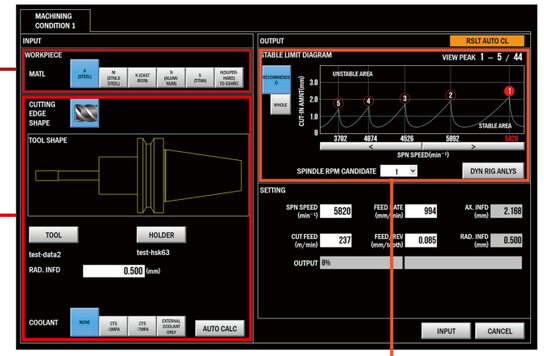
Supportive system for determining processing conditions Option

This system creates stability limit charts using a unique algorithm based on pre-registered workpiece material and tool information, and it then automatically determines the best processing conditions such as spindle rotation speed, feeding speed, and cutting amount. This greatly shortens time required for selecting processing conditions.

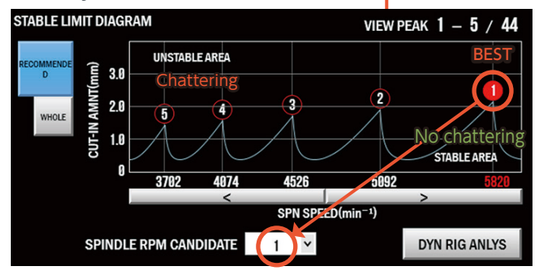
Step1 Workpiece material

Step2 Tool property





Stability limit chart

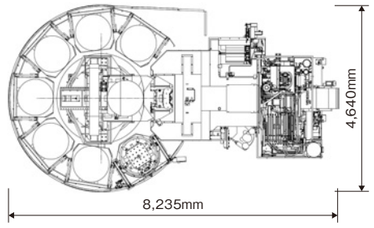


Comprehensive pallet automation systems that keeps on evolving for users

Since JTEKT released the first FMS in 1972, it has delivered a large number of systems and has earned high trust as an indispensable system manufacturer in the era of factory automation in both Japan and overseas.
We propose the best factory automation that meets each customer's needs, combining optimum mechatronics technologies and software modules developed in-house on the basis of our extensive experience.

FMC (Flexible Manufacturing Cell)

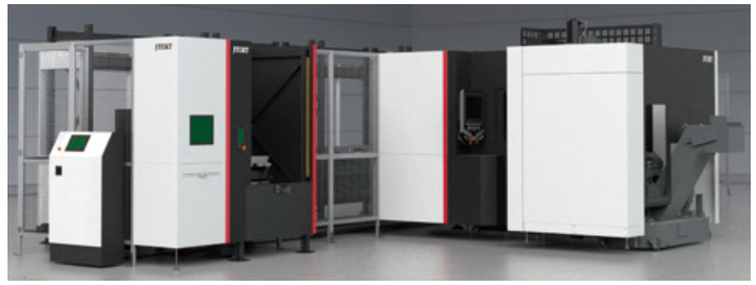
The FMC uses a vertical rack system which reduces the required installation space. Time loss during pallet change is kept at a minimum by combining this with a high speed APC. The pallet storage capacity is increased for unmanned operation at night and on holidays.



6 pallets per level up to 3 levels

FMS (Flexible Manufacturing System)

Unmanned operation, more flexibility in the system and an improved level of control. A state-of-the-art production system that only JTEKT. with our grasp on key points of the FA, are able to provide. The module configuration can be easily expanded, so that any future additions of machines, racks, loading stations of the like can be carried out with ease.



12 pallets per level × up to 3 levels
(36 pallets)
Up to 10 machines,
up to 4 load stations

Initiatives for carbon neutrality

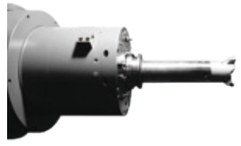
JTEKT's products and technologies are directly and indirectly linked to environmental measures for our customers' products and manufacturing processes.

Energy visualization

Collective monitoring of electric power consumption and CO_2 emission

Reduction of operating energy

Technology improvement and evolution for each module such as reduction of spindle purge air



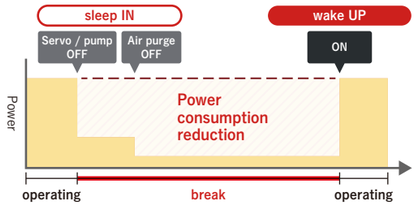
CO_2 emissions
Up to 50% reduction*

Adoption of energy-saving products

Hydraulic unit with inverter (Recommend)

Power reduction of [non-processing time]

Equipped with sleep IN and wake UP mode



*Depends on JTEKT measurement method.

Machine specifications

[ ] is special specifications

Item		Unit	FH5000S-i	FH5500S-i	FH5500SX-i
Table & Pallet	Table dimensions (pallet dimensions)	mm	□550 (□500)		
	Rotary table indexing angle	°	0.001 : DD		
	Pallet height (from floor)	mm	1,100	1,100 (1,200 RGV compatible)	
	Max load on pallet	kg	1,000		
	Table indexing time (90° indexing)	sec	0.7 (～ 500kg) , 1.0 (～ 1,000kg)		
	Pallet change time	sec	11		
	Pallet clamp		Seat & locating pin		
Stroke	X-axis	mm	800	900	
	Y-axis	mm	800		
	Z-axis	mm	880		
	Distance between spindle nose and table center	mm	100～980		
	Distance between spindle center and top of pallet	mm	50～850		
	Max. workpiece swing x Max. workpiece height	mm	φ900×1,100		
Feeds	Rapid feed rate (X, Y and Z)	m/min	60		
	Cutting feed rate (X, Y and Z)	m/min	0.001～60		
	Rapid acceleration (X, Y and Z)	G	1/1/0.7~1.2		0.7/0.7/0.7~1.2
Spindle	Spindle speed	min-1	① 15,000 (standard) ② 15,000 (High-speed)	15,000	
	Spindle diameter (front bearing bore)	mm	① φ85 ② φ70	φ120	
	Spindle nose shape		7/24 Taper No. 40	7/24 Taper No. 50	
	Spindle motor, short-time/continuous	kW	① 37 (25%ED) /22kW ② 30 (25%ED) /18.5kW	37 (25%ED) /22kW	45 (25%ED) /30kW
	Max. spindle torque, short-time/continuous	N・m	① 303 (10%ED) /119 ② 55 (10%ED) /26	303 (10%ED) /119	530 (15%ED) /239
	Motor power transmission system		Built-in		
	Spindle lubrication method		Grease	Oil air	
ATC	Tool holding capacity	Tool	60 (90/119/200/240/320)	45 (60/121/180/240/330)	
	Tool selection		Absolute address		
	Max. tool diameter	φ	φ140×510	φ250×545	
	Max. tool length	mm	510	545	
	Tool mass	kg	8	27	
	Tool change time (Tool to Tool)	sec	1.3	2.5 (～ 15kg) 2.8 (15 ～ 27kg)	
	Tool change time (Chip to Chip)	sec	2.4 (~4kg) 2.7 (4~8kg)	3.8 (～ 15kg) 4.0 (15 ～ 27kg)	
	Tools Holder		MAS BT40	MAS BT50	
	Pull stud		MAS P40T-1	MAS P50T-1	
Dimensions	Floor space (width × depth)	mm	2,980×4,850 (60MG)	3,550×4,850 (45MG)	
	Machine height	mm	2,809	3,180	
	Machine weight	kg	11,500	12,000	13,000

Accessories

●Standard ／ □Option ／ — unavailable

Item	Equipment name		FH5000S-i	FH5500S-i	FH5500SX-i
Table and pallet	Indexing table	DD table (with encoder)	●	●	●
	Pallet	Standard pallet screw hole □550	●	●	●
		Pallet screw hole □500	□	□	□
		Edge locator for pallets (2 per set)	□	□	□
	Addition of pallet	Single piece screw hole	□	□	□
Spindle relations	Specifications	15,000 min^{-1} 〈303/119N・m (10%ED/continuous)〉〈37/22kW (25%ED/continuous)〉	●	●	—
		15,000 min^{-1} 〈55/26N・m (10%ED/continuous)〉〈30/18.5kW (25%ED/continuous)〉〈High-speed type〉	□	—	—
		15,000 min^{-1} 〈530/239N・m (10%ED/continuous)〉〈37/22kW (25%ED/continuous)〉	—	—	●
		20,000 min^{-1} 〈221N・m (10%ED/continuous)〉〈37/18.5kW (25%ED/continuous)〉	□	—	—
		Positioning block for angle head holder	□	□	□
		BT40 (7/24 Taper #40)	●	—	—
		BT50 (7/24 Taper #50)	—	●	●
		BIG PLUS specifications	□	□	□
		HSK specifications	□	□	□
	Collet	MAS II	□	□	□
		MAS I	●	●	●
		JIS	□	□	□
		CAT	□	□	□
		DIN	□	□	□
Tool magazine	Tool capacity	45 tools (Chain type)	—	●	●
		60 tools (Chain type)	●	□	□
		90 tools (Chain type)	□	—	—
		119 tools (Chain type)	□	—	—
		121 tools (Chain type)	—	□	□
		180 tools (Matrix type)	—	□	□
		200 tools (Matrix type)	□	—	—
		240 tools (Matrix type)	□	□	□
		320 tools (Matrix type)	□	—	—
		330 tools (Matrix type)	—	□	□
Coolant relations	Coolant supply unit	Coolant supply unit (scraper type)	●	●	●
		Coolant supply unit (2-tank type)	□	□	□
		Non-sludge coolant tank	□	□	□
	Through coolant	Spindle-through coolant spec/1MPa through pump	□	□	□
		Spindle-through coolant spec/2MPa through pump	●	●	●
		Spindle-through coolant spec/3MPa through pump＋Cyclone filter	□	□	□
		Spindle-through coolant spec/7MPa through pump＋Cyclone filter	□	□	□
	Magnet separator	Magnetic separator for castings	□	□	□
	External nozzle coolant	8-nozzle coolant (Coolant with 2 nozzles on the upper side of the spindle)	●	●	●
	Overhead shower coolant	Simultaneous discharge with external nozzle coolant	●	●	●
		Individual discharge	□	□	□
	Coolant cooling		□	□	□
	Oil skimmer	Belt type	□	□	□
	Chip box		□	□	□
	Splash gun (at APC)		□	□	□
	Mist collector		□	□	□
	Air blower	External nozzle type	□	□	□
		Holder type	□	□	□
Splash guard	Enclosure guard		●	●	●
	Door interlock at operating position	Electromagnetic lock type	●	●	●
	APC door interlock	Electromagnetic lock type	●	●	●
	Magazine door interlock	Electromagnetic lock type	●	●	●
	Internal lighting		●	●	●
Operation control function, others	Ground fault interrupter		□	□	□
	Cooler for control cabinet inside		□	□	□
	Signal light (Three layers)		□	□	□
	Portable manual pulse generator (with handle enable button)		●	●	●
Labor saving function	Pallet changer (APC)	Shift type	●	●	●
	Flexible Manufacturing Cell (FMC)	1 stage: 6	□	□	□
		2 stages: 12	□	□	□
		3 stages: 18	□	□	□
Support for high accuracy	Spindle cooling unit		□	●	●
	BTS (Ballscrew Thermo Stabilizer) function		●	●	●
	Scale feedback (X-, Y- and Z-axes)		□	□	□
	Touch sensor function	Wireless (nonenergized) centering and reference surface correction functions	□	□	□
		Automatic tool length measurement function and measurement reference surface (Interference area will occur)	□	□	□
		Automatic measurement function	□	□	□
		Automatic measurement correction function	□	□	□
		Rotational coordinate system correction function	□	□	□
		Rotational coordinate axis correction function	□	□	□
	Automatic tool length measurement function	Automatic tool length measurement device (Retractable)	□	□	□
	Tool breakage detection unit inside the magazine	Touch switch type	□	□	□
	Spindle thermo stabilizer function		□	□	□
Optimizing processing conditions	Supportive system for determining processing conditions		□	□	□
	Optimal control function for shape accuracy and feed rate UHPC (Ultra High-Speed Precision Control)		□	□	□
Tool diagnosis function	Tool life forecast system		□	□	□
Environmental thermal displacement correction	Intelligent thermal displacement correction system		□	□	□
	Thermal displacement correction system		□	□	□

CNC unit

●Standard ／ □Option

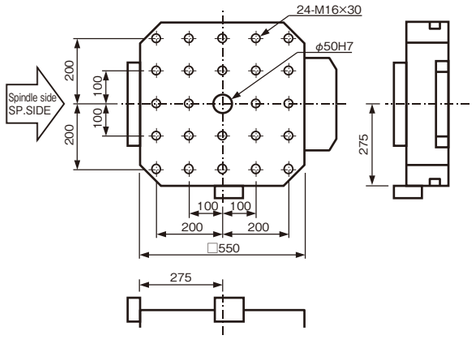
Item	Specifications		Type
NC equipment	FANUC 32iMB Plus		●
Axis to control	4 axes (4 axes at the same time; B axis: indexing only)		●
Control type	Contour control (Linear/arc interpolation)		●
	Incremental/absolute		●
Minimum setting unit	0.001mm		●
Maximum command value	±999,999.999mm		●
Input type	EIA/ISO code		●
Drive motor	AC servo motor	FH5000S-i/FH5500S-i 7 units	●
		FH5500SX-i 8 units	●
Detector	Absolute position detection pulse encoder		●
Cutting feedrate function	F 5-digit direct command override 0-200% (increment of 10%)		●
Spindle rotation speed function	S 5-digit direct command		●
Auxiliary function	M 3-digit code		●
Tool selection function	T 2-digit code (socket number command)		●
	T 3-digit code (socket number command)		●
LCD setting display tool	TOYOPUC Touch ver.2 19-inch color LCD display (with touch panel)		●
Manual pulse generator	One unit included		●
Other functions	G, H, D, etc.		●
Standard accessory functions	Workpiece coordinate system preset (G92.1)		●
	Machine coordinate system (G53)		●
	Workpiece coordinate system (G54～G59)		●
	Fixed cycle (G73, G74, G76, G80～G89, G98, G99)		●
	Programmable data input (G10)		●
	Programmable parameter input		●
	Custom macro		●
	Custom macro common variables #100～199, #500～999		●
	C language executor, macro executor		●
	Auxiliary function lock		●
	Rigid tap		●
	Tool correction amount memory C		●
	Tool length compensation (G43, G44, G49)		●
	Tool position offset		●
	Tool diameter and cutter radius compensation		●
	Backlash correction		●
	Backlash correction for rapid feeding and cutting feeding		●
	Interpolation type pitch error compensation		●
	Interpolation type straightness compensation		●
	Program storage capacity 4 Mbyte (equivalent to 10,240m)		●
	Number of registerable programs expansion 1: Max. 1,000 programs		●
	Program editing		●
	Program protection		●

●Standard ／ □Option

Item	Specifications	Type
Standard accessory functions	Expanded program editing	●
	Background editing	●
	Clock function	●
	Operation history display	●
	Display of operating hours and parts quantity	●
	Actual speed display	●
	Help function	●
	Self-diagnosis function	●
	System configuration screen	●
	Memory card input/output	●
	Built-in Ethernet	●
	RS232C interface (not including the RS232C port)	●
	Inch/metric switch	●
	Inverse time feed	●
	Speed control by acceleration of arc interpolation	●
	Polar coordinate command	●
	Thread cutting / synchronous feeding	●
	Program resume	●
	Programmable mirror image	●
	Automatic corner override	●
	Scaling	●
	Coordinate rotation	●
	Addition of workpiece coordinate system 48-pairs	●
	Small-diameter deep hole drill cycle	●
	Tool correction quantity (400)	●
	Manual handle retrace function	●
	Program restart aid function output	●
	Quick program resume	●
	Arbitrary angle chamfer conner R	●
	One-touch macro call	●
	NURBS interpolation	●
	AI contour control	●
	AI contour control Ⅱ	●
	Fast processing	●
	Read-ahead block count expansion	●
Special accessory function	F 1-digit feeding	□
	Part program storage size 8Mbyte	□
	Number of registerable programs expansion 2: Max. 4,000 programs	□
	Addition of workpiece coordinate system 300-pairs	□
	Data server function	□
	Compact flash memory card (32GB) * Included when the data server function is available.	□

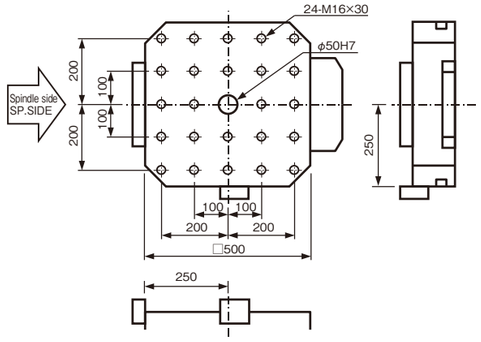
Threaded hole pallet

□550 Specification



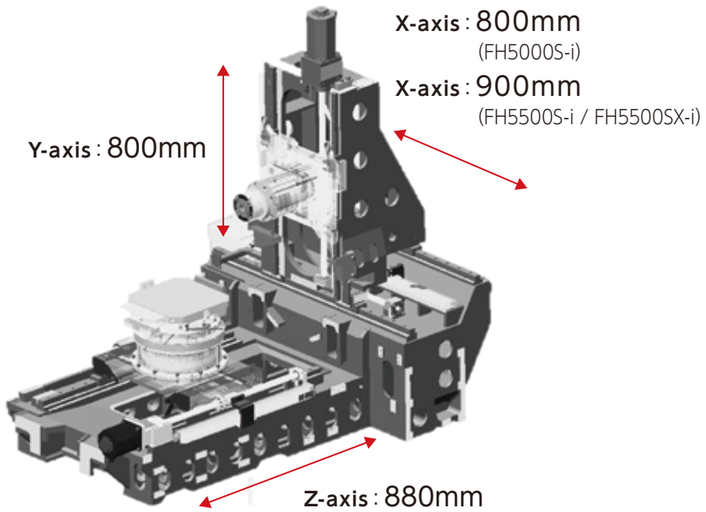
●Pitch tolerance of M16 screw is ±0.2
●No alignment reference hole is provided for the edge locator.

□500 Specification Option

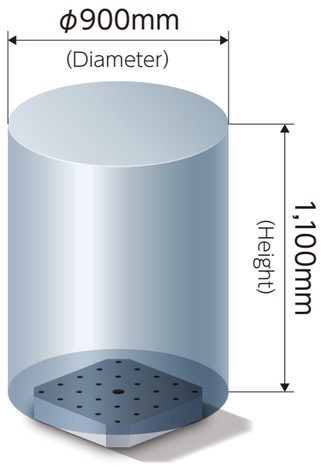


●Pitch tolerance of M16 screw is ±0.2
●No alignment reference hole is provided for the edge locator.

Machining range



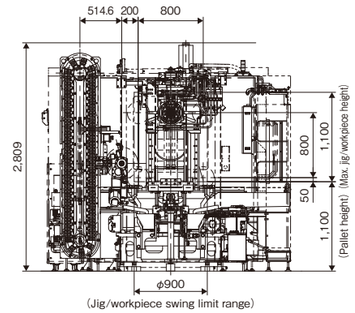
Max. workpiece

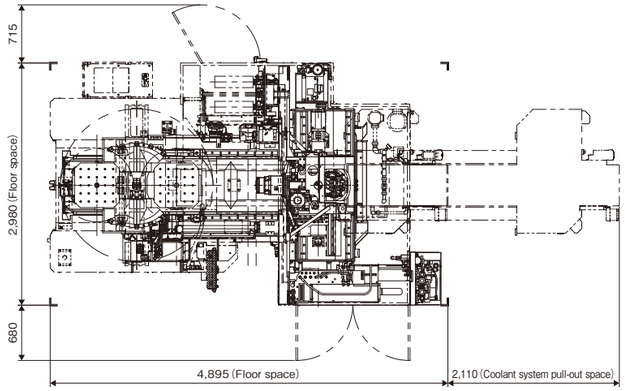


Layout plan

FH5000S-i

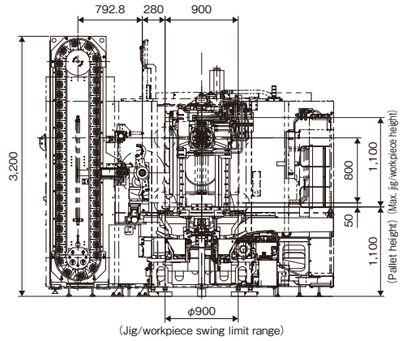
(Unit: mm)

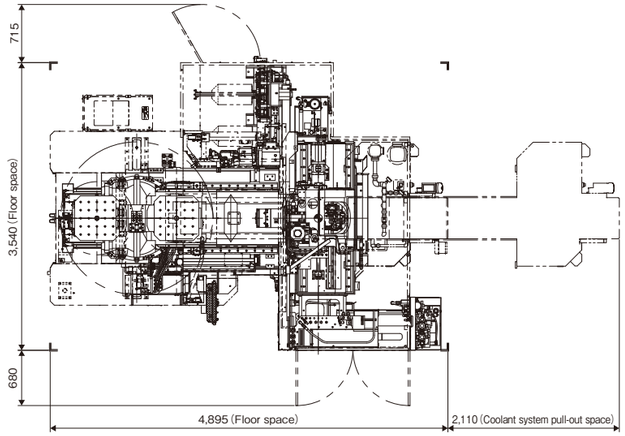




FH5500S-i

(Unit: mm)





FH5500SX-i

(Unit: mm)