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# MACHINE TOOLS

 **MITSUBI SEIKI KOGYO CO.,LTD.**



JQA-0904 JQA-EM2883



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Ultimate precision is “ Identity of MITSUI SEIKI”

In search of Ultimate Precision



Mitsui Seiki production history begins with the manufacturing of precision gauge blocks and micrometers. Today' s machine tools manufactured at our world class precision facility are recognized world wide as the “Mother Machines” for the most stringent accuracies requirements in manufactured parts.

Today' s CNC technologies with sophisticated software and servo systems provide easy corrections for accuracy compensation. However, geometrical accuracy (volumetric accuracy) cannot to be corrected by servo and software compensation. Geometrical features such as straightness of travel, squareness, flatness that produce accurate volumetric positions in the machining envelop are only achieved by hand scraping and fitting of the machine tool components.

Accuracy requirements for Jig Borers, Jig grinders, thread grinders and high precision machining centers can only be realized when the machines are hand scraped and finished assembled by this technique.

Expertise of making ultimate precision machine tools from a long history



The "Mother Machines" are not mass produced. These machine tools are scraped, fit, assembled and measured with this process repeated until the final precision tolerance required is achieved. There is no compromising when removing the last micron of inaccuracy from a machine tool.

All critical assemblies and components such as spindles, ball screws, tables, etc. that make these "Mother Machines" are produced in our factory. This assures the required quality, accuracy and process controls needed to produce this caliber of machine tools.

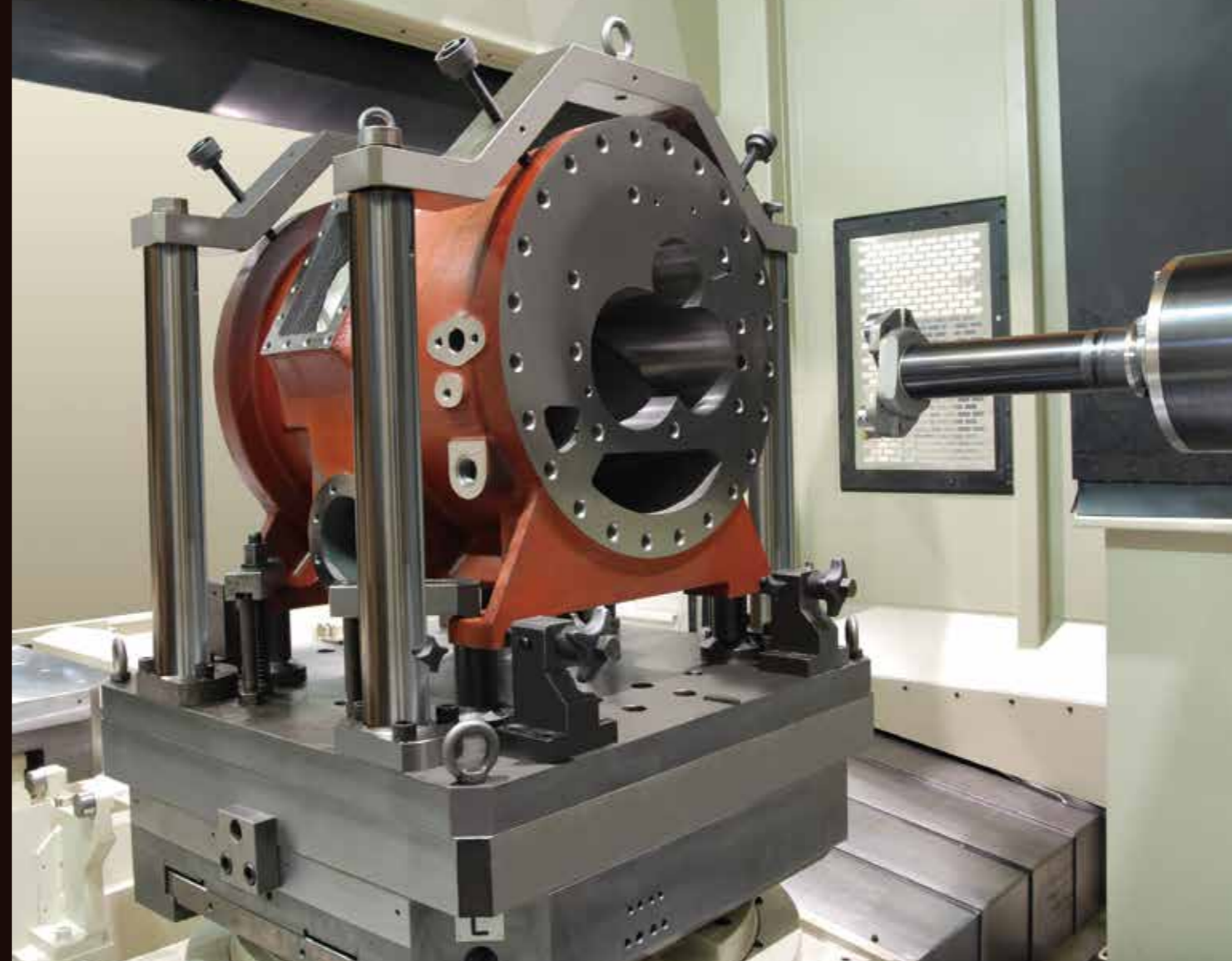
The technical ability to measure accuracies smaller than  $1\mu\text{m}$  provides Mitsui Seiki with the capability to produce ultra precision machine tools.



When measuring accuracies of  $1/1000\text{mm}$ , the measuring equipment used must be 10 times more accurate (capable of  $1/10000\text{mm}$  measurement) to assure reliable consistent results. But when using high accuracy measurement equipment, it must also be in perfect environmental conditions. Also, the procedures when using this equipment requires consistent measurement procedures and the equipment must be traceable to an international bureau of standards for compliance for usage in high precision measurement environments. Mitsui Seiki's history is in the development of manufacturing measurement equipment and the development of industrial standards for high precision industries. This is why Mitsui Seiki is a world leader in the manufacture of precision machine tools.

Horizontal Machining Center

Horizontal Machining Center



HU50A



HU63EX



HPX63 II



HU80A



HU100series



H5D



HS8A

Item		HU50A	HU63EX	HPX63 II	HU80A
Stroke	X-axis mm	720	900	1,000	1,200
	Y-axis mm	700	800	800	950
	Z-axis mm	650	800	900	900
Table	Palette size mm	500×500	630×630	630×630	800×800
	Maximum loading weight kg	800	1,200	1,200	1,600
Spindle	Taper	ISO 7/24 Taper No.40		ISO 7/24 Taper No.50	
	Spindle rotation speed min <sup>-1</sup>	50~8,000 (OP:12,000/20,000)		15~6,000 (OP:12,000/15,000/20,000)	
Rapid feed rate	m/min	36	24	54	24
APC		2APC Front side turn type			2APC Front side boxer type
ATC Number of tools to be stored		60			
Machine weight	kg	About12,000	About17,000	About18,000	About20,000

OP : Option

Item		(STANDARD)	HU100	(OPTION)	HS8A	H5D	H6D
Stroke	X-axis mm	1,300		1,600 / 2,000	1,800 (OP:2,400/3,000)	850	1,300
	Y-axis mm	1,000		1,200 / 1,500	1,500 (OP:1,800)	700	900
	Z-axis mm	1,000		1,200 / 1,400	1,200 (OP:1,500)	750	900
Table	Palette size mm	1,000×1,000		1,200×1,200	1,500×1,500	630×630	800×800
	Maximum loading weight kg	3,000		2,000(1 <sup>*</sup> ) / 5,000 / 8,000	8,000	1,200	1,600
Spindle	Taper	ISO 7/24 Taper NO.50					
	Spindle rotation speed min <sup>-1</sup>	15~4,500		6,000(26kW) / 6,000(37kW) / 12,000(30kW)	15~3,150 (OP:6,000)	60~6,000 (OP:80~8,000)	
Rapid feed rate	m/min	20		15 (differs by stroke)	X:7 YZ:10	5	
APC		2APC Front Boxer Type		4/6/8/10	OP:2/4/6	OP:2/4/6/8/10	
ATC Number of tools to be stored		60		90/120/180/240/360	60 (OP:90/120/180/240/360)		
Machine weight	kg	About30,000		differs by spec.	About35,000	About18,000	About21,000

OP : Option

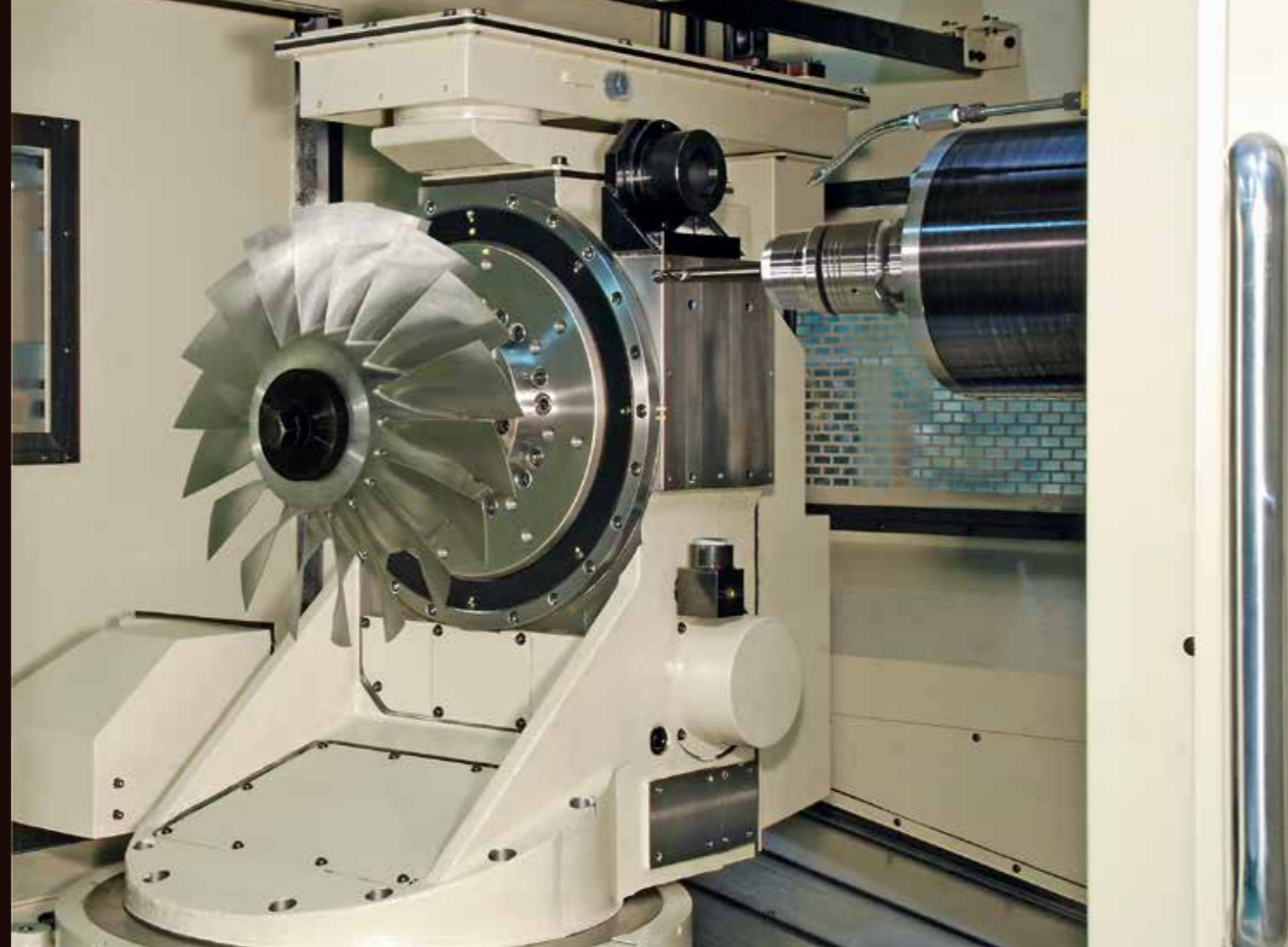
## Horizontal Machining Center



HW550A



HW630A



5-axis Control Horizontal Machining Center(Spindle Tilt)



HU100-TS



HU100-T

## MITSUI SEIKI MACHINE TOOLS

### 5-axis Control Horizontal Machining Center(Table on Table)



HU50-T



HU63-T

Item		HW550A	HW630A
Stroke	X-axis mm	750	1,000
	Y-axis mm	FH:800 / HW:850	
	Z-axis mm	850	
Table	Palette size mm	550×550	630×630
	Maximum loading weight kg	800	1,000
Spindle	Taper	ISO 7/24 Taper NO.50 (OP:HSK-A100)	ISO 7/24 Taper NO.50 (OP:HSK-A100)
	Spindle rotation speed min <sup>-1</sup>	50~6,000 (OP:15,000)	50~6,000 (OP:15,000)
Rapid feed rate	m/min	48	48
APC	2APC Front side turn type		
ATC Number of tools to be stored	FH:40 / HW:60		
Machine weight	kg	About 18,000	About 19,000

OP : Option

Item		HU50-T	HU63-T	HU100-T	HU100-TS
Stroke	X-axis mm	770	900	1,300	1,300
	Y-axis mm	700	800	1,000	1,500
	Z-axis mm	650	800	1,000	1,400
	B-axis °	-90~+180 (Indexing of 0.001°)			-30~+120
	C-axis °	360 (Indexing of 0.001°)			360
Table	Palette size mm	φ360		φ600	1,000×1,000
	Maximum loading weight kg	100	300	600	3,000
Spindle	Taper	ISO 7/24 Taper NO.50	ISO 7/24 Taper NO.50	ISO 7/24 Taper NO.50	ISO 7/24 Taper NO.50
	Spindle rotation speed min <sup>-1</sup>	50~12,000 (OP:20,000 (40T))	15~6,000 (OP:12,000/20,000)	15~4,500	10,000
Rapid feed rate	X,Y,Z-axis m/min	36	24	20	15
	B-axis min <sup>-1</sup>	30	15	10	10
	A-axis min <sup>-1</sup>	30	15	10	6
APC		4	Not available	Not available	Option
ATC Number of tools to be stored		60	60	60	60
Machine weight	kg	About 15,000	About 18,000	About 30,000	About 40,000 (2APC,60ATC)

OP : Option

### 5-axes Control Horizontal Machining Center(Trunnion)



HU50A-5X

HU63A-5X

HU80A-5X



HU100-5X



HU100-5XL



HU100-5XLL

### MITSUI SEIKI MACHINE TOOLS

### Vertical Machining Center

VU50A

VU65A



### Precision Profile Center

PJ812



Item		HU50A-5X	HU63A-5X	HU80A-5X	HU100-5X	HU100-5XL	HU100-5XLL
Stroke	X-axis mm	720	900	1,200	1,300 / 1,500(OP)	2,000	2,500
	Y-axis mm	850	900	1,000	1,200	1,500	1,750
	Z-axis mm	850	900	1,050	1,200	1,400	1,400
	B-axis °	360(Indexing of 0.001°)					
	C-axis °	+5~-95(Indexing of 0.001°)(OP:+20~-110)					
Table	Palette size mm	500×500	630×630	800×800	1,000×1,000		1,700×1,000
	Maximum loading weight kg	650	800	1,200	2,000		3,000
Spindle	Taper	ISO 7/24 Taper NO.50					
	Spindle rotation speed min <sup>-1</sup>	50~12,000 (OP:20,000)	15~6,000 (OP:12,000/20,000)	15~4,500 (OP:12,000)		4,500	
Rapid feed rate	X,Y,Z-axis m/min	X:24 YZ:36	X:12 YZ:24		XYZ:12	X:10 YZ:12	
	B-axis min <sup>-1</sup>	12	10		6	4	
	A-axis min <sup>-1</sup>		6		4	2	
APC		2APC Front side shuttle type (OP:6/8/10)	2APC Front side boxer type (OP:6/8/10)		OP:2/4/6/8/10		Option
ATC Number of tools to be stored		60 (OP:90/120/180/240/360)					
Machine weight kg		About 18,000	About 26,000	About 28,000	About 35,000	About 40,000	About 43,000

OP : Option

Item		VU50A	VU65A	PJ812
Stroke	X-axis mm	700	1,280	1,200
	Y-axis mm	500	650	800
	Z-axis mm	450	610	500
Table	Table size mm	1,100×580	1,500×600	1,200×800
	Maximum loading weight kg	600	1,500	1,500
Spindle	Taper	ISO 7/24 Taper NO.40	ISO 7/24 Taper NO.50	ISO7/24 Taper NO.40
	Spindle rotation speed min <sup>-1</sup>	120~12,000 (OP:20,000)	15~6,000 (OP:12,000/20,000)	30,000
Rapid feed rate m/min	XY:36 Z:24	24	24	
ATC Number of tools to be stored		20 (OP:30/40/60)		40
Machine weight kg		About 9,400	About 13,000	About 15,000

OP : Option

### 5-axes Control Vertical Machining Center



Vertex100X



### Vertical Machining Center

### MITSUI SEIKI MACHINE TOOLS

### Linear Motor Drive High-speed Precision Center



VL30



VL30-5X



Vertex75X III



Vertex55X III



Vertex55 III



VL50

Item		Vertex55 III	Vertex55X III	Vertex75 III	Vertex75X III	Vertex100X
Stroke	X-axis mm	550		750		1,000
	Y-axis mm	600		800		1,000
	Z-axis mm	500		700		750
	B-axis °	—	+15~-105(Indexing of 0.001°)	—	+15~-105(Indexing of 0.001°)	
	C-axis °	—	360(Indexing of 0.001°)	—	360(Indexing of 0.001°)	
Table	Table size mm	700×600	φ400	900×800	φ500	φ485 φ700
	Maximum loading weight kg	800	350(at A-axis 0°)	1,000	500	600 1,200
Spindle	Taper	ISO 7/24 Taper NO.40				
	Spindle rotation speed min <sup>-1</sup>	50~25,000 or 50~15,000				25,000 12,000
Rapid feed rate	m/min	XYZ:48	XYZ:48 A:30min <sup>-1</sup> C:50min <sup>-1</sup>	XYZ:48	XYZ:48 A:20min <sup>-1</sup> C:40min <sup>-1</sup>	XYZ:48 AC:100min <sup>-1</sup>
ATC Number of tools to be stored		24 (OP:40/60)	40	24 (OP:40/60)	40	40 (OP:130)
Machine weight	kg	About8,800	About9,500	About11,500	About12,500	About20,000

OP : Option

Item		VL30	VL30-5X	VL50
Stroke	X-axis mm	200		400
	Y-axis mm	300		300
	Z-axis mm	200		200
	B-axis °	—	-40~+110(Indexing of 0.001°)	—
	C-axis °	—	360(Indexing of 0.001°)	—
Table	Table size mm	300×400	φ180	500×400
	Maximum loading weight kg	200	20	400
Spindle	Taper	typeI:HSK-E25 / typeII:HSK-E32 / typeIII:HSK-E40		
	Spindle rotation speed min <sup>-1</sup>	typeI:500~50,000 / typeII:300~30,000 / typeIII:250~25,000		
Rapid feed rate	m/min	40	XYZ:40 A:100min <sup>-1</sup> C:150min <sup>-1</sup>	40
ATC Number of tools to be stored		12		16
Machine weight	kg	About5,800	About6,500	

※The spindle can be selected the following 3 types.

Jig Grinder



J300G



J350G



Jig Borer



J6CN



J7CN



J4GDN



J6GCN



J7GAN



J1620



J1230

Item		J350G	J300G	J3GEN	J4GDN	J6GCN	J7GAN
Stroke	X-axis mm		500		610	1,020	1,530
	Y-axis mm		300		410	760	1,020
Table	Table size mm	700×350	700×350		660×460	1,040×840	1,550×1,060
	Maximum loading weight kg		300		750	1,200	2,000
Quill	Chopping stroke mm		95			135	
	Number of chopping cycles cycle/min*		200			400	
Machine weight kg		About 3,300	About 3,200	About 3,300	About 4,300	About 9,300	About 14,000

\*at 25mm stroke

Item		J6CN	J7CN
Stroke	X-axis mm	1,020	1,530
	Y-axis mm	760	1,020
	Z-axis mm	300	
Table	Table size mm	1,280×960	1,830×1,200
	Maximum loading weight kg	1,200	2,000
Spindle	Taper	ISO 7/24 Taper N0.45 (OP:ISO 7/24 Taper N0.50)	
	Spindle rotation speed min <sup>-1</sup>	40~3,200	
Machine weight kg	About 9,000	About 14,000	

OP : Option

Item		J1220	J1230	J1620
Stroke	X-axis mm	2,000	3,000	2,100
	Y-axis mm	1,250		1,600
	Z-axis mm	500		
Table	Table size mm	2,000×1,250	3,000×1,250	2,500×1,600
	Maximum loading weight kg	3,000	4,000	
Spindle	Spindle rotation speed min <sup>-1</sup>	50~10,000 (OP : 25,000)		
ATC Number of tools to be stored		60		10
Machine weight kg		About 30,000	About 35,000	About 32,000

OP : Option



External Thread Grinder (GSE-A,GSE-B series)

GSE30A



GSE50A



GSE100A



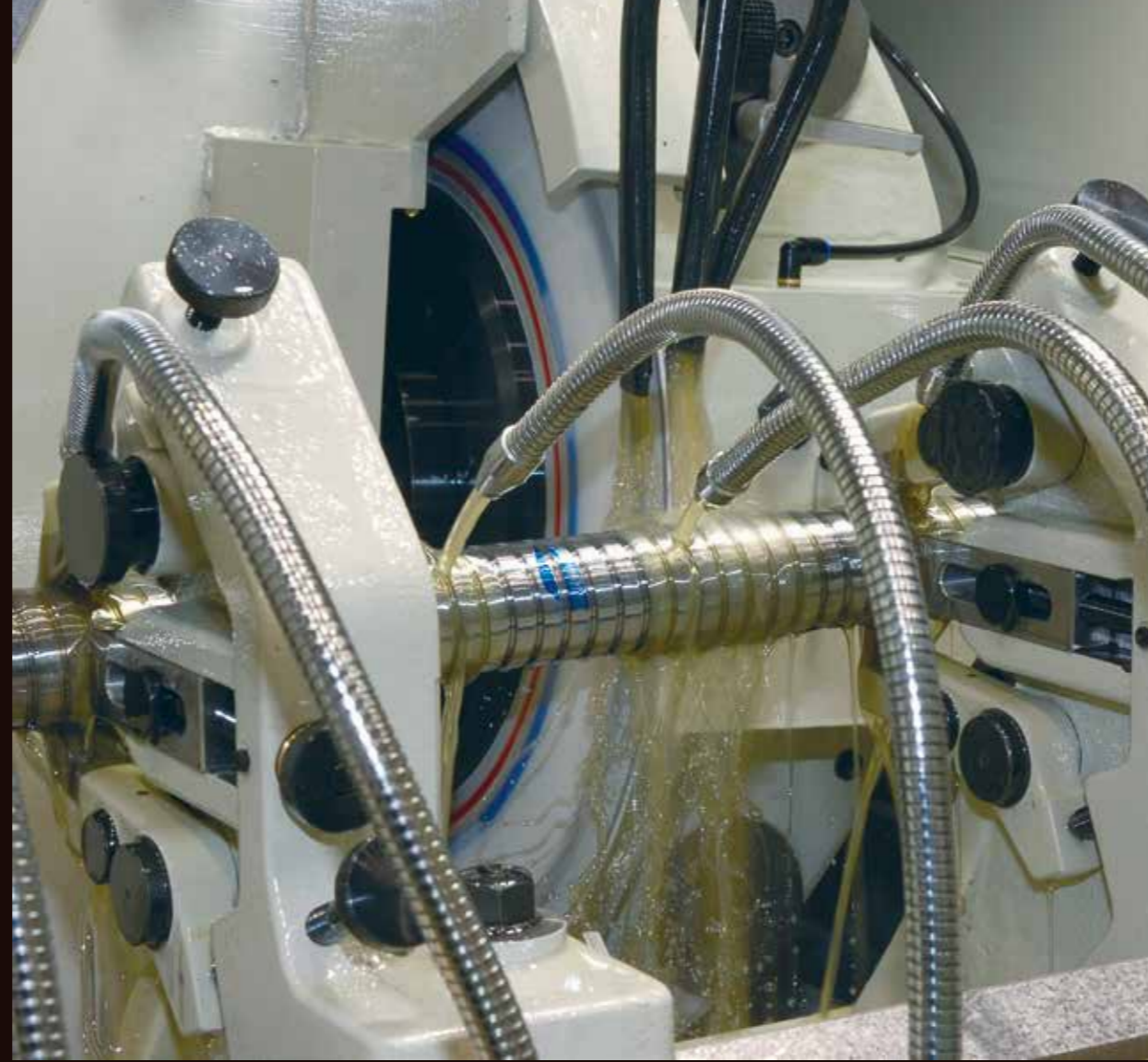
GSE200A



GSE320A



GSE500A



MITSUI SEIKI MACHINE TOOLS

External Thread Grinder (GSE-H,GSC-H series)



GSE200H



GSC100H

Internal Thread Grinder



GSN180iS

External Thread Grinder (GSH-A series)



GSH200A

Item		GSE30A	GSE50A	GSE100A	GSE200A	GSE320A	GSE500A	GSE100B	GSE200B	GSE320B	GSH200A			
Capability/capacity	Swing over table	mm	φ 270	φ 480			φ 480							
	Distance between cente	mm	450	750	1,250	2,250	3,650	5,400	1,250	2,250	3,650	2,250		
	Maximum screw length can be grindin	mm	300	500	1,000	2,000	3,200	5,000	1,000	2,000	3,200	2,000		
Wheel spindle	Wheel size	mm	φ350×10~32×φ152.4	φ510×10~50×φ228.6			φ450×10~26×φ152.4 (CBN wheel) / φ510×10~50×φ228.6 (Standard wheel)			φ480×10~32×203.2 (CBN wheel) / φ380×15×φ152.4 (STD. wheel)				
	Max. grinding wheel surface speed	m/min	2,700									4,800 (CBN wheel) / 2,700 (Standard wheel)	7,200 (CBN wheel) / 3,600 (STD. wheel)	
	Wheel spindle motor power	kW	2.2	3.7			7.5			11			15	
Table stroke	mm	360	650	1,150	2,150	3,300	5,100	1,150	2,150	3,300	2,150			
Work spindle	Penetrating hole diameter	mm	φ 35	φ 76 (OP: φ 103)			φ 172			φ 76 (OP: φ 103)			φ 76	
	Spindle rotation speed	min <sup>-1</sup>	100									80	100	80
Machine weight	kg	About 4,500	About 9,500	About 11,000	About 13,000	About 18,500	About 20,000	About 11,000	About 13,000	About 18,500	About 13,000			

OP : Option

Item		GSE100H	GSE200H	GSC100H	
Capability/capacity	Swing over table	mm	φ 480	φ 480	
	Distance between cente	mm	1,250	2,250	1,250
	Maximum screw length can be grindin	mm	1,000	2,000	1,000
Wheel spindle	Wheel size	mm	φ510×10~50×φ228.6	φ510×10~50×φ228.6	
	Max. grinding wheel surface speed	m/min	3,600		
	Wheel spindle motor power	kW	OP:45	OP:45	
Table stroke	mm	1,440	2,440	1,440	
Work spindle	Penetrating hole diameter	mm	φ 76 (OP: φ 103)	φ 76 (OP: φ 103)	
	Spindle rotation speed	min <sup>-1</sup>	100		
Machine weight	kg	About 13,000	About 15,000	About 13,000	

OP : Option

Item		GSN180iS	
Capability/capacity	Swing over table	mm	φ 480
	Maximum screw length can be g.	mm	180
Maximum tilt angle	°	±10	
Wheel spindle	Stander type	min <sup>-1</sup>	15,000~24,000
	High stiffness type	min <sup>-1</sup>	8,000~15,000
	High speed type 1	min <sup>-1</sup>	24,000~45,000
	High speed type 2	min <sup>-1</sup>	45,000~70,000
Table stroke	mm	400	
Work spindle	Spindle rotation speed	mm	100
Machine weight	kg	About 7,000	



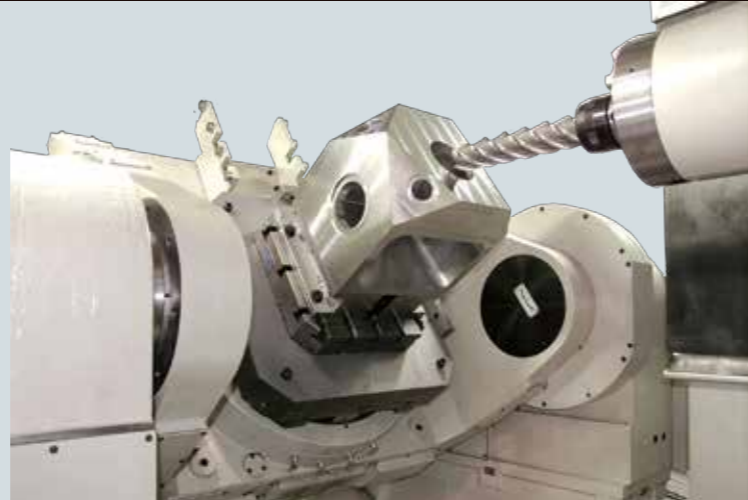
Mitsui Seiki “Mother Machines” are produced in our main factory in Kawajima-machi, central Saitama. This factory is designed to maintain thermo stability and vibration stability needed to achieve these exceptional tolerance requirements. Temperature control is important because one meter of iron expands and contracts 0.01 mm with each 1°C of temperature difference. Accomplishing 1μm accuracy in a machine tool is impossible unless the assembly environment is tightly controlled. Mitsui Seiki maintains the tightest temperature controlled environment in the industry for machine tool assembly.



Vibration control is also very important. Induced frequencies effect accuracy measurements on the assembly floor. Our factory has over 1700 pylons every three meters, supporting 1200 mm thick concrete floors and the pylons extent to bedrock to assure solid foundations for building “Mother Machines”. All cranes are isolated from the machine assembly floor to isolate the vibration they may create.



Today's leading edge technologies are increasing the demand for higher accuracy machine tools. **MITSUI SEIKI MACHINE TOOLS**

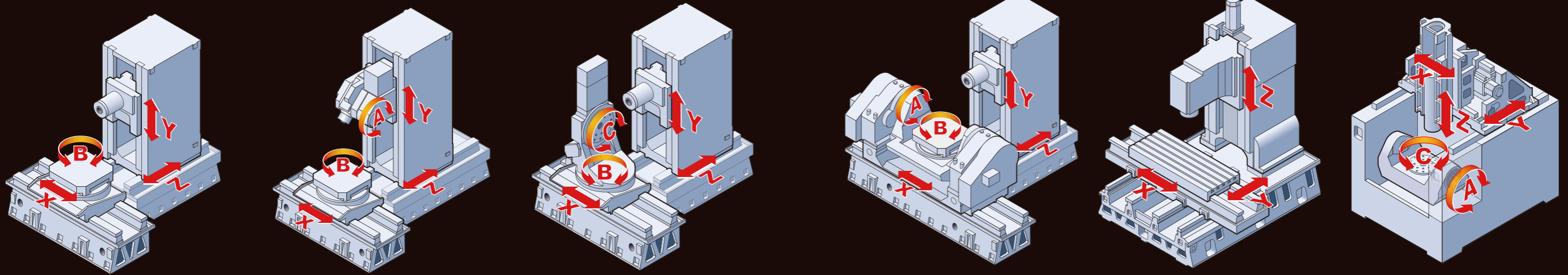


Essential industries such as aerospace, auto, transport machine, construction machinery, energy, electrical machine, semiconductor, engineering equipment, precision equipment, machine tool, mould, tool, medical equipment, industrial machinery, bio, electrical power generation, etc are directly and indirectly supported by these styles of machine tools.

Mitsui Seiki maintains the highest reputation in supporting these industries with newly developed technologies, ultra precision machine tool products and support services that are meeting the most demanding requirements in industry.



Name of each axis



Horizontal Machining Center (4-axes)

5-axes Control Horizontal Machining Center (Spindle Tilt)

5-axes Control Horizontal Machining Center (Table on Table)

5-axes Control Horizontal Machining Center (Trunnion)

Vertical Machining Center(3-axes)

Vertical Machining Center(5-axes)

Machining Center Main Specification Chart

	Item	Stroke						Table(Palette) Size mm	Maximum Workpiece (diameter X height) mm	Maximum Loading Weight kg
		X-axis	Y-axis	Z-axis	B-axis	A-axis	C-axis			
		mm	mm	mm	°	°	°			
Horizontal Machining Center	HU50A	720	700	650	360	-	-	500×500	φ800×1000	800
	HU63EX	900	800	800	360	-	-	630×630	φ950×1050	1200
	HPX63 II	1000	800	900	360	-	-	630×630	φ1050×1050	1200
	HU80EX	1200	950	900	360	-	-	800×800	φ1200×1200	1600
	HU100	1300	1000	1000	360	-	-	1000×1000	φ1500×1400	3000
	HS8A	1800	1500	1200	360	-	-	1500×1500	φ2000×1800	8000
	H5D	850	700	750	360	-	-	630×630	φ950×1030	1200
	H6D	1300	900	900	360	-	-	800×800	φ1420×1080	1600
	HW550R	750	850	850	360	-	-	550×550	φ850×950	800
	HW630R	1000	850	850	360	-	-	630×630	φ1000×950	1000
5-Axes Control Horizontal Machining Center	HU50-T	770	700	650	360	-	-90~+180	φ360	φ500×350	100
	HU63-T	900	800	800	360	-	-90~+180	φ360	φ800×618	300
	HU100-T	1300	1000	1000	360	-	-90~+180	φ600	φ1200×700	600
	HU50A-5X	720	850	850	360	+5~-95	-	500×500	φ750×700	650
	HU63A-5X	900	900	900	360	+5~-95	-	630×630	φ950×900	800
	HU80A-5X	1200	1000	1050	360	+5~-95	-	800×800	φ1200×1000	1200
	HU100-5X	1300/1500	1200	1200	360	+5~-95	-	1000×1000	φ1500×1200	2000
	HU100-5XLL	2000	1500	1400	360	+5~-95	-	1000×1000	φ2000×1200	2000
	HU100-5XLL	2500	1750	1400	360	+5~-95	-	1700×1000	φ2500×1200	3000
	HU100-TS	1300	1500	1400	360	-30~+120	-	1000×1000	φ1250×1900	3000
Vertical Machining Center	VU50A	700	500	450	-	-	-	1100×580	-	600
	VU65A	1280	650	610	-	-	-	1500×600	-	1500
	Vertex55 III	550	600	500	-	-	-	700×600	-	800
	Vertex75 III	750	800	700	-	-	-	900×800	-	1000
	VL30	200	300	200	-	-	-	300×400	-	200
	VL50	400	300	200	-	-	-	500×400	-	400
	PJ812	1200	800	500	-	-	-	1200×800	-	1500
5-Axes Control Vertical Machining	Vertex100X	1000	1000	750	-	+15~-105	360	φ700	φ1250×850	1200
	Vertex55X III	550	600	500	-	+15~-105	360	φ400	φ750×525	350
	Vertex75X III	750	800	700	-	+15~-105	360	φ500	φ950×650	500
	VL30-5X	200	300	200	-	+40~-110	360	φ180	-	20

Machining Center Main Spindle Specification Chart

Machine	Taper Spindle	Item	Built-in										Gear Drive								
			HSK					BT					BT		BT						
			A100	A63	E40	E32	E25	#40					#50		#50						
		RPM	12000	25000	25000	30000	50000	8000	12000	15000	20000	25000	30000	6000	10000	12000	15000	2250	3150	4500	6000
HU50A								15/11 282/117	15/11 292/117		185/15 286/14			30/25 420/239							
HU50A-5X HU50-T														30/25 420/239							
HPX63 II												185/15 286/14			30/25 262/191					2-shift 185/15 601/487	3-shift 26/22 1081/915
HU63EX, HU63A-5X, HU63-T HU80EX, HU80A-5X												185/15 286/14		30/25 420/239			3-shift 26/22 1740/1472				2-shift 22/185 714/601
HU100 series HU100-5X, HU100-5XL HU100-5XLL												185/15 286/14					3-shift 185/15 1277/1036	3-shift 26/22 1794/1519	3-shift 26/22 1794/1519	3-shift 37/30 3332/2700	
HU100-TS												185/15 286/14		22/185 167/95.4							
HS8A															Quill 37/30 2195/1777	2-shift 37/30 2195/1777				3-shift 26/22 2210/1870	
H5D H6D													direct 22/185 150/126				Without gear change 185/15 444/326				
HW550A, HW630A														30/22 600/420		30/25 262/191					
VL30 VL30-5X VL50																					
PJ812																					
Vertex100X														185/15 191/14			26/22 177/159				
Vertex55 III, Vertex55X III Vertex75 III, Vertex75X III																					
VU50A														direct 7.5/5.5 300/100		185/15 286/14					
VU65A														185/15 286/14			30/25 420/239				2-shift 185/15 616/501

Upper : Power(kw 30min/continuous)  
Lower : Torque(Nm 30min/continuous \* 1min/continuous \*\* 25%ED/continuous)  
Yellow=Standard Other=Option "-" =Not available