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FEELER® FAIR FRIEND GROUP
FAIR FRIEND ENTERPRISE CO., LTD.

MACHINE TOOLS DIVISION
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TOP 100 TAIWAN BRANDS
ISO 9001
ISO 14001
CE

Website Facebook

The CNC Machine Tool Builder with

PERFORMANCE Beyond EXPECTATION

www.feeler.com

With You Success Together

19.08.1000-S601000001

FEELER'S SUCCESS YOUR PROSPECTS

Working with a right partner multiplies your performance. FFG (Fair Friend Group) provides the world with a diversity of machine tools and reaches multiple successes with its proactive, effective strategic formula - intensive R&D engineering, worldwide production sites, global marketing through overseas subsidiaries, along with cutting-edge technology, uncompromising quality and thorough service. As the world's top machine tools maker, FFG offers far beyond machinery products but total solutions and ultimate value.

OUTSTANDING HIGHLIGHTS

- World 3rd Largest Machine Tools Group.
- World No. 1 Largest Machine Tools Group For Automotive Turnkey.
- No.1 VMC manufacturer in the world since 2009, with 8,000 units; over 10,000 units production outputs in 2011.
- HVTC Fair Friend College of Electromechanics attracts 2,300 students as FFG's talent tank.
- 2012 TAIWAN authoritative commercial magazine "Common Wealth" TOP 1000 manufacturers: Fair Friend Ent. Co., Ltd and Good Friend Int'l Holdings Inc. ranking No.1 for Machinery Industry and Machine Tools, respectively.
- In "Excellence in Research and Innovation" Awards, TIMTOS 2011, FFG won 3 awards as the biggest winner.
- The largest sole advertise sponsor and the largest Taiwanese exhibitor at both EMO and TIMTOS 2009/2011/2013/2015.
- Won the prize of 2008 AI Outstanding Product Award and was in the TOP 100 excellence equipment suppliers, together with world-famous machine tool manufacturers such as DMG, MAZAK, MORI SEIKI, MAKINO, MAG and Agie Charmilles. FFG ranked NO.1
- The best quality and service machine tools manufacturer from Taiwan – evaluated by Asia Pacific Metal Working Equipment News.
- The only Taiwanese machine tools maker won the National Quality Award and the Taiwan Excellence Gold Arard.
- The only machine tools group reported by Forbes, Business Week, the Wall Street Journal, National TV in Spain and China central TV.
- 2011, awarded "TAIWAN Top 100 Brands" by Taiwan Ministry of Economic Affair, as a high recognition to FFG and FEELER.













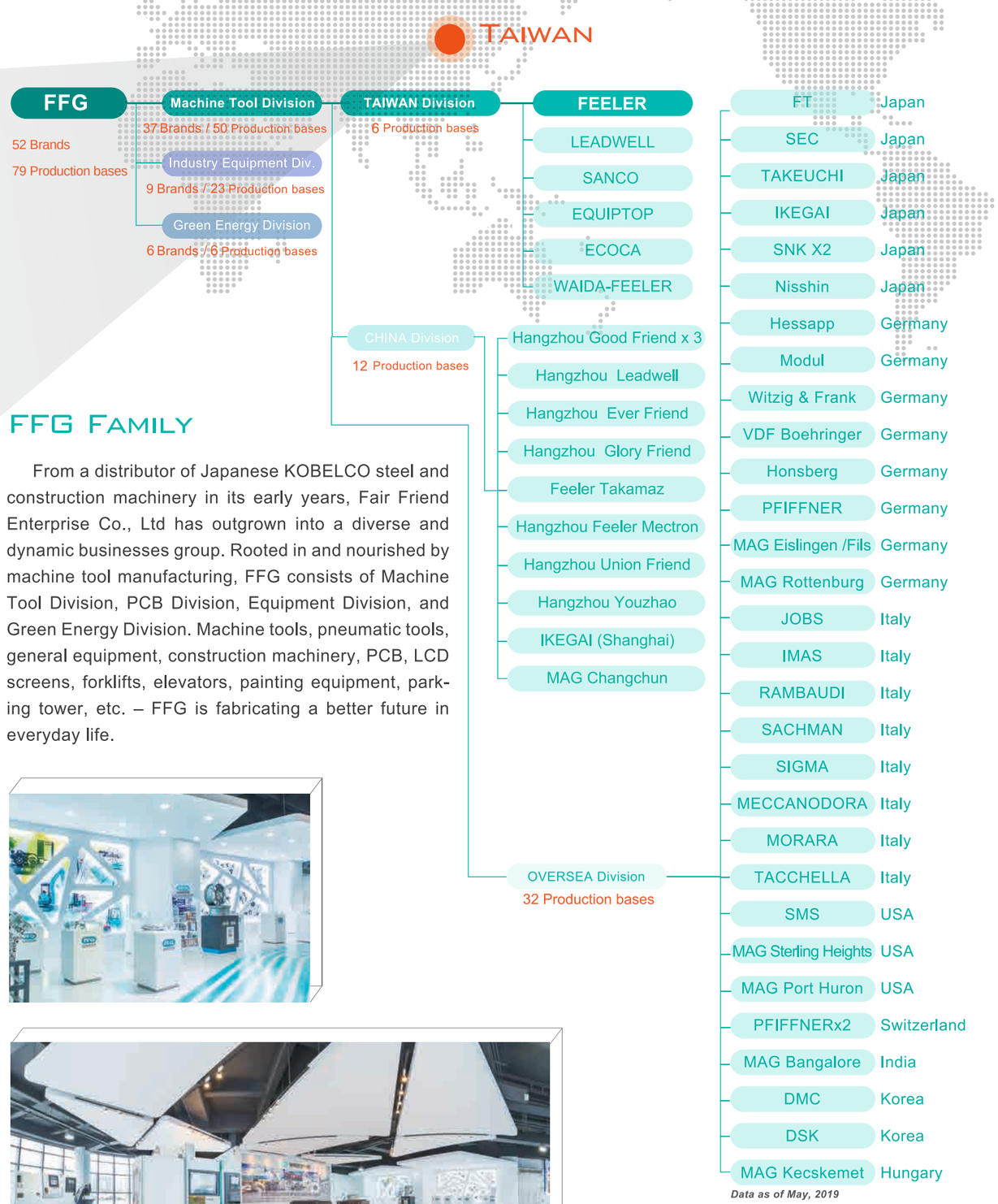
Your Best PARTNER for Machine Tools

FFG Machine Tool Division

Fair Friend Group, one of the globally major machine tool builders, provides the world with quality machine tools by the synergy from its teams of more than 10,000 dedicated employees. Every year more than 10,000 units of machine tools are well produced from all our sites which scatter in Taiwan, China, Japan, the U.S.A. and Italy. A complete product lineup ranges from vertical / horizontal/double column machining centers, vertical/horizontal turning centers, large CNC boring & milling centers, various types of grinders, large floor boring machines, 5-axis machining centers to double column CNC grinding machines – a truly one-stop machine tool maker meets all your needs. Since its establishment in 1979, Fair Friend has been investing intensive endeavors into providing advanced machinery technology for a better tomorrow. “Integrity, Quality, Innovation, Unceasing Improvements, Customer First, Continuous Growth” are the very core values and cornerstones where Fair Friend’s crew build up prosperity and pride. Along with capabilities of quality manufacturing, cost down production, extensive service network and throughout sales channels, we are rewarded with a leading reputation among all the Taiwanese machine tool builders and have kept reaching new pinnacles. Nevertheless, as climb higher we look even higher. “World No. 1 Machine Tool Builder,” isn’t a goal for inspiring but implementing. Sticking to our formula of success and keen ambition, Fair Friend is turning a great vision into reality.



▲ Fair Friend - Nantun, TAIWAN



Data as of May, 2019

FFG Family

From a distributor of Japanese KOBELCO steel and construction machinery in its early years, Fair Friend Enterprise Co., Ltd has outgrown into a diverse and dynamic businesses group. Rooted in and nourished by machine tool manufacturing, FFG consists of Machine Tool Division, PCB Division, Equipment Division, and Green Energy Division. Machine tools, pneumatic tools, general equipment, construction machinery, PCB, LCD screens, forklifts, elevators, painting equipment, parking tower, etc. – FFG is fabricating a better future in everyday life.

Deep Market Penetration In CHINA

FFG's early entrance into the Chinese market in 1993 resulted in a solid foundation for our success today. Our state-of-art manufacturing facilities and precise workmanship deliver quality machine tools that help our customers achieve productivity and profitability. Zhejiang Province is FFG's production stronghold. The production plants scattering over 3 major industrial bases provide remarkable productivity to satisfy enormous local demands. 90 branch offices located all over China weave an expansive sales and service network. Furthermore, FFG set up Fair Friend Institute of Electromechanics in 2008 to develop more talents for the future.



Good Friend China Headquarters, CHINA



Hangzhou Good Friend –Hsiaosha (66,000 m²), CHINA



Hangzhou Good Friend –
Xiasha Technology Park (231,000 m²), CHINA



Hangzhou Takamaz



Hangzhou Good Friend -
Jiangdong Technology Park (660,000 m²), CHINA



Glory Friend / ANEST IWATA



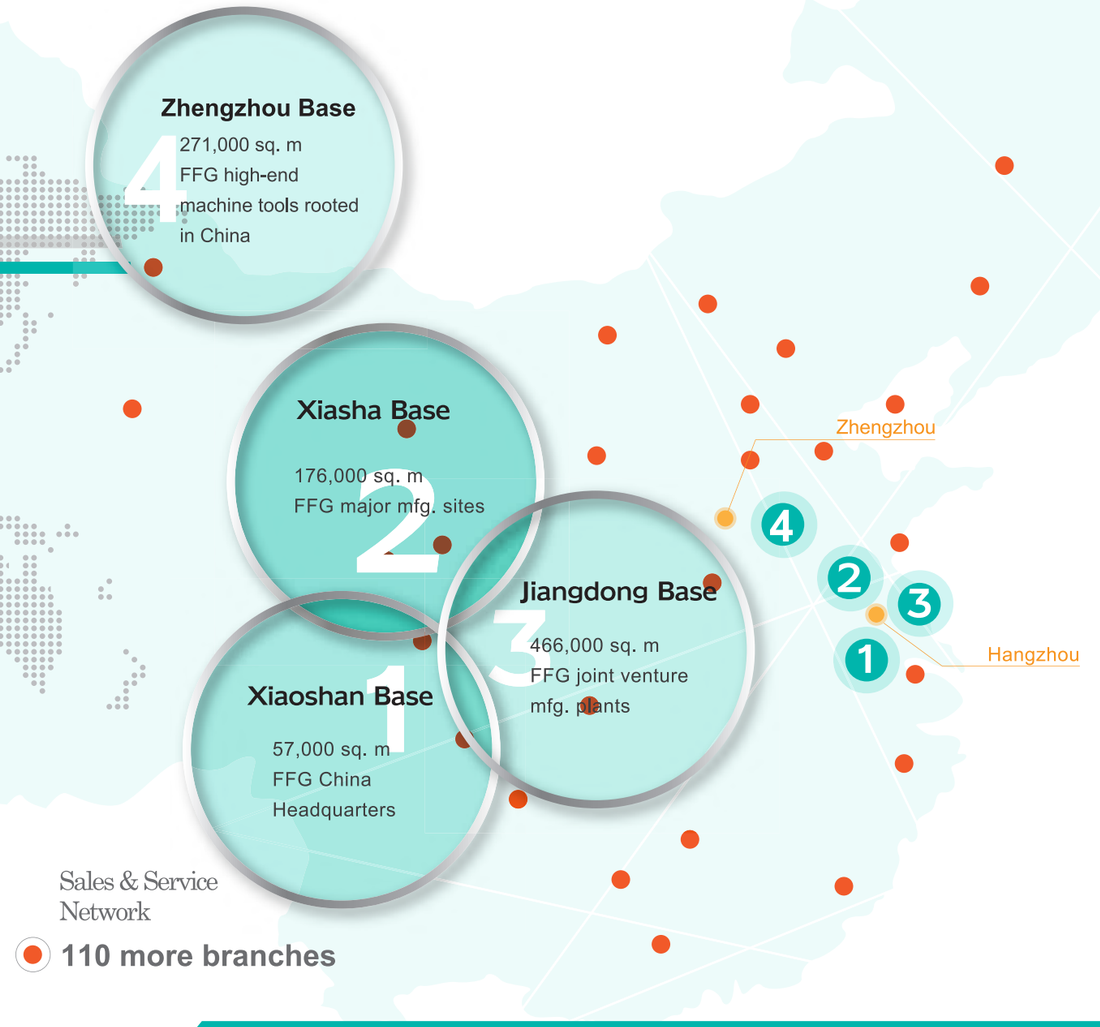
Hangzhou Every Friend (82,500 m²), CHINA



Hangzhou Global Friend (59,400 m²), CHINA



Hangzhou Leadwell (66,000 m²), CHINA





Hangzhou Institute of Electromechanics (2,300 students)



Zhengzhou Institute of Electromechanics(13,000 students)

FFG Fair Friend Institute of Electromechanics

Fair Friend Institute of Electromechanics were located Hangzhou and Zhengzhou. It consists of departments of machinery design and manufacture, mold design and manufacture, automated electromechanics, etc. 15,000 students are well educated here to be professional , quality manpower for machinery industry. Ample training resources, 100% employment rate, award-winning credits make FFG Hangzhou Institute of Electromechanics ranking Top 3 amid 3-year vocational colleges in Zhejiang.

Global Scale
Technology and Marketing

HESSAPP
Established : 1946
Joined FFG : 2013
Vertical turning centers



MODUL
Established : 1900
Joined FFG : 2013
Gear hobbing, chamfering machining centers



Witzig & Frank
Established : 1865
Joined FFG : 2013
Multi-spindle and multi-station machine centers



VDF BOEHRINGER
Established : 1844
Joined FFG : 2013
Turning Centers



Pfiffner precise solutions
Established : 1989
Joined FFG : 2015
Rotary Transfer Machines



MAG Eislingen/Fils
Established : 2005
Joined FFG : 2015
Milling, coldforming, CV joint, transfer centers and manufacturing systems



MAG Rottenburg
Established : 2005
Joined FFG : 2015
Spindles , Rotary tables



MAG Bangalore
Established : 2005
Joined FFG : 2015
Application technology



DMC
Established : 1944
Joined FFG : 2015
Vertical / Horizontal machining centers , hydraulic parts

DSK MACHINERY
Established : 1995
Joined FFG : 2016
CNC Heavy Duty Machines (Horizontal Lathe,Vertical Lathe/Double Column Machining Center,Roll Grinder)



Pfiffner precise solutions
Established : 1970
Joined FFG : 2015
Rotary Transfer Machines, Retrofit machines



MAG Kecskemet
Established : 2005
Joined FFG : 2015
ATC
Chip conveyor
Components



MAG Changchun
Established : 2005
Joined FFG : 2015
Vertical / Horizontal machining centers , Coldforming machines



QUALITY
is vital at FEELER

Through M&A and joint venture, FFG strengthens technological and global marketing power effectively. Advanced technologies are transferred and applied in our machine tool products to offer our users the quality and performance beyond their expectation. Our joint ventured corporations or subsidiaries are set in Japan, the US, Germany and Italy, the countries where cutting-edge machinery technologies are cradled. FFG's overseas bases also build up extensive, worldwide distribution channels. In most corners of the world, you can have excellent machine products and technical supports delivered by FFG. We will just be there for you.

SNK
Established : 1949
Joined FFG : 2016
FMS/FMC systems, Bridge Type Multi-Centers, Machine Tools for Aircraft Parts, Roll Lathes, 3D Measuring Machines,Various Types of Machining Centers



SNK Nissin
Established : 1952
Joined FFG : 2016
Vertical/Horizontal Machining Center, Large lathe, Grainder



Takeuchi
Established : 1945
Joined FFG : 2006
PCB drilling machine



FT
Established : 1961
Joined FFG : 2008
FFG and TAKAMAZ joint venture corporation,as sales&service base of FFG CNC machine tools.Also a J.V. production site in China.



IKEGAI
Established : 1889
Joined FFG : 2014
Large turning centers
Plastic injection molding machines
Engine/generator manufacturing
Printing equipment
Packaging machinery equipment



SMS
Established : 1854
Joined FFG : 2007
Integrated Systems, Vertical Turning Lathes,Universal Trimming Machines.



MAG Port Huron
Established : 2005
Joined FFG : 2015
Horizontal machining centers, Transfer lines , Turnkey



JOBS
Established : 1978
Joined FFG : 2011
Large high speed and power 5-axis milling centers

SACHMAN
Established : 1962
Joined FFG : 2011
Large milling column milling centers

SIGMA
Established : 1950
Joined FFG : 2011
5 axis vertical machining centers.

RAMBAUDI
Established : 1945
Joined FFG : 2010
Gantry type 5-axis milling centers



meccanodora
Established: 1961
Joined FFG: 2017
Internal and external grinding machines, multi-technology with integrated grinding, turning and milling technology

MORARA
Established: 1919
Joined FFG: 2017
Internal and external grinding machines, multi-technology with integrated grinding, turning and milling technology

TACCHELLA
Established: 1921
Joined FFG: 2017
Internal and external grinding machines, multi-technology with integrated grinding, turning and milling technology



IMAS
Established : 1948
Joined FFG : 2016
Multi-tasking rotary table transfer machines



MAG Sterling Heights
Established : 2005
Joined FFG : 2015
Horizontal machining centers, Transfer lines , Turnkey



Machine Tool Product Line

CNC

Turning

FTC SERIES
CNC Turning Center
FTC-10 / 20 / 20L / 30


FTC-30

Slant Bed CNC Turning Center
FTC- 300 / 350 / 350L(MC) / 350XL(MC)
350LY / 350SLY / 450(MC) / 640(MC) / 640L(MC)
FTB- 350 / 350L / 350XL


FTC-640LMC

HT SERIES
CNC Turning Center
HT-30MC / 30Y / 30SY / 40Y


HT-30Y

FT SERIES
CNC Turning Center
FT-200 / 250 / 350 / 350A L


FT-250SY

FVT SERIES
Heavy Duty CNC Vertical Lathe
FVT-450 / FVT-600(MC) / FVT-800 /
FVT-1000(MC) / FVT-1600


FVT-600


FVT-1000MC

Milling

VFP SERIES
Vertical Machining Center
VFP-800(A) / 1000(A) / 1300(A)


VFP-1000A

VMP SERIES
Vertical Machining Center
VMP-23(A) / 23Aapc / 30(A) / 32(A) / 32Aapc
40(A) / 45(A) / 50(A) / 65(A)


VMP-45A


VMP-23AAPC

VMX SERIES
Vertical Machining Center
VMX-820 / 1020


VMX-1020

HV SERIES
Vertical Machining Center
HV-32A / 32Aapc / 40A / 50A


HV-40A

NBP SERIES
Vertical Machining Center
NBP-1000(A) / 1100(A) / 1300(A)


NBP-1300A

VB SERIES
Vertical Machining Center
VB-1400(A) / 1650(A) / 1900(A) / 2200(A)


VB-1650A

U SERIES
5-Axis vertical machining center
U250 / 600P / 800 / 1000 / UB660


U-600P


U-800

EH SERIES
Horizontal Machining Center
EH 320/ 320APC


EH-320

FMH SERIES
Horizontal Machining Center
FMH-400 / 500 / 630 / 800


FMH-630


FMH-800

TC SERIES
Drilling & Tapping Center
TC-20α (Turret /Arm Type)


TC-20α

SVW SERIES
Double Column Machining Center
SVW-2217~SVW-4225


SVW-4223

FDM SERIES
Double Column Machining Center
FDM-3228~FDM-8235


FDM-4228

SBM SERIES
CNC Bed Type Universal Milling Machine
SBM-2000H / 2500H / 3000H / 3500H
SBM-2000V / 2500V / 3000V / 3500V


SBM-2000V

SHM SERIES
CNC Horizontal Boring & Milling Machine
SHM-630L / 800 / 800L


SHM-800

SHB SERIES
CNC Horizontal Boring & Milling Machine (Extendable Spindle)
SHB-11025/11030/11040RS / SHB-11030/11040RM
SHB-13025/13030/13040RS / SHB-13030/13040 RM/RL


SHB-11025RS

FLEXIBLE
Manufacturing System (FMS)





State-of-the-art MANUFACTURING Capabilites

WWW.FEELER.COM

Over the years, Fair Friend(FEELER) Machine Tools have earned a world-class reputation for product excellence and reliability. This success is the result of our innovative design, in-house machining capabilities, and rigorous quality control. In order to manufacture machines that fully meet customers' requirements all around the world, we utilize an advanced and integrated manufacturing system. At the core of Fair Friend's manufacturing capabilities are our state-of-the-art production facilities.













Fair Friend's products are manufactured by a complete system of R&D, manufacturing, inspection, and testing. The pictures shown here are only a few of Fair Friend's most extensive manufacturing capabilities. This level of advanced manufacturing equipment, combined with the great care paid to every step throughout the manufacturing process, assures the optimum performance of each Fair Friend CNC Machine Tool.





Discover FEELER's R&D Edges

Constant breakthroughs establish Fair Friend with a reputation of "Innovation and Full Customer Satisfaction". Fair Friend is committed to providing the best possible machines to customers. One of the most important reasons for Fair Friend's product excellence is our "Total Dedication to R&D".

At Fair Friend, we emphasize R&D as a crucial factor to our success. At FEELER alone, R&D staff makes up one-third of the total workforce. In addition, we invest 4% of our annual revenue on R&D, per year. Our innovative brainpower can competently and efficiently fulfill your design and application requirements.



PRE-PRODUCTION SIMULATION SYSTEM

- 3D simulation for low cost high efficiency production.
- User-friendly, visualized marketing tool.
- In-time connection between simulation of auto control signals and the on-site machine is available.
- Simulations for best processing flow provide various possible plans for evaluation.
- Lowering investment risks, boosting investment decision-making.

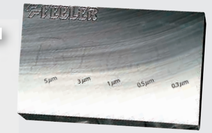




REMOTE MONITORING SYSTEM



- Providing CNC machine tool remote operation or monitoring function.
- Remote diagnosis is available, which shortens trouble shooting time.
- Downtime is reduced and thereby improved efficiency is obtained.
- Facilitating plant digital management
- Reducing a great deal of cost and enhancing professionalism.



UNPARALLELED APPLICATION ENGINEERING

FEELER's rigid machine design and unparalleled Application Engineering capabilities are best demonstrated in this work piece. The top curvature surface of this work piece displays five letters of B1000. Each letter is machined with different height as follow: B (5μm), 1 (3μm), 0 (1 μm), 0 (0.5μm), 0 (0.3μm). This result is only possible through the combination of superb machine rigidity and breakthrough CAD/CAM technology.

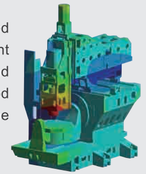


ZEISS 3D COORDINATE MEASURING MACHINE

FEELER utilizes the 3D Coordinate Measuring Machine (CMM) to inspect critical parts ensuring outstanding parts accuracy.

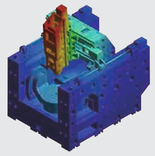
FINITE ELEMENT ANALYSIS

FEELER'S machine structure is designed and analyzed using advanced Finite Element Analysis software for dynamic simulation and structural analysis. This design method assures optimum structural rigidity, machine accuracy and reliability.



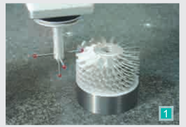
OPTIMUM DYNAMIC RIGIDITY

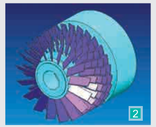
Utilizing the advanced Finite Element Analysis (FEA), FEELER obtained an outstanding spindle design with optimum dynamic rigidity and resonance frequency.



REVERSE ENGINEERING

FEELER has abundant experiences in implementing Reverse Engineering, which is processed as below:











1. First measured via 3D Coordinate Measurement Machine (CMM)
2. and it creates a 3D Solid Modeling
3. This 3D Modeling generates the CAD/CAM parameters
4. and the part is machined via 5-Axis Machining Technology
5. A reverse-engineered work piece is created successfully

FTC series

CNC Turning Center



FTC-10 / FTC-20 / FTC-20L / FTC-30

MODEL	UNIT	FTC-10	FTC-20	FTC-20L	FTC-30
Swing over bed	mm	Ø510	Ø600	Ø600	Ø580
Standard turning diameter	mm	Ø180	Ø250	Ø250	Ø310
Max. turning diameter	mm	Ø240	Ø350	Ø350	Ø450
Max. turning length	mm	255	343	613	621
Chuck diameter	inch	6" (8")	8" (10")	8" (10")	10" (12")
Swing over saddle Chuck size	mm	Ø240	Ø380	Ø380	Ø440
X-axis travel	mm	120+20	175+25	175+25	225+25
Z-axis travel	mm	290	380	650	670
Rapid traverse rate X/Z axir	m / min	24 / 24	24 / 24	24 / 24	20 / 20
Spindle nose	type	A2-5	A2-6	A2-6	A2-8
Spindle speed	rpm	6,000	4,500	4,500	3,500
Spindle bore diameter	mm	Ø56	Ø62	Ø62	Ø88
Through hole draw tube	mm	Ø45	Ø52	Ø52	Ø75
Spindle bearing diameter	mm	Ø90	Ø100	Ø100	Ø130
Spindle taper	MT	MT#6	1:20	1:20	1:20
No. of tools	set	10	8	8	8
Standard O.D. tool size	mm	□20	□25	□25	□25
Max. I.D. tool size	mm	Ø25	Ø40	Ø40	Ø40
Tailstock quill diameter	mm	Ø50	Ø65	Ø65	Ø100
Tailstock quill stroke	mm	80	90	90	100
Tailstock quill taper	MT	MT-3	MT-4	MT-4	MT-4
Spindle motor (30min/continuous)	kW	11 / 7.5	18.5 / 15	18.5 / 15	22 / 18.5
Servo motors (X/Z)	kW	X=1.2 / Z=1.2	X=3.0 / Z=3.0	X=3.0 / Z=3.0	X=3.0 / Z=3.0
Coolant tank capacity	ℓ	115	130	95	95
Floor space	mm	2,005 x 1,317	2,780 x 1,535	2,825 x 1,557	2,920 x 1,685
Machine weight	kg	2,500	3,550	3,850	5,080

*Specifications are subject to change without prior notice.



Slant Bed CNC Turning Center

FTC-300 / FTC-350(MC) / FTC-350L(MC) / FTC-350XL(MC)
FTC-350LY / FTC-350SLY / FTC-450(MC) / FTC-640(MC) / FTC-640L(MC)
FTB-350 / FTB-350L / FTB350XL

MODEL	UNIT	FTC-300	FTC-350 (MC)/L (MC)/XL (MC)	FTC-350S	FTC-350LY	FTC-350SLY	FTC-450 (MC)	FTC-640(MC)/L(MC)	FTB-350/L/XL
Swing over bed	mm	ø550	ø580	ø650	ø580	ø650	ø670	ø750	Ø580
Swing over saddle	mm	ø260	ø400	ø450	ø400	ø450	ø450	ø550	Ø400
Standard turning diameter	mm	ø180	ø327 (165)	ø156	ø200	ø200	ø327 (ø165)	ø271 (ø240)	Ø327
Max. turning diameter	mm	ø300	ø350 (235)	ø300	ø350	ø350	ø450 (ø270)	ø640 (ø470)	Ø400
Max. turning length	mm	310	340 (310)/660(600)/1000(970)	210	585	515	650 (600)	808 (760)/1,440(1,170)	340/660/1000
Bar work capacity	mm	ø52	ø52 (ø52)/ (ø66)	ø52 | ø45	ø52	ø52 | ø45	ø78	ø117.5	Ø52
X-axis travel	mm	150+20	175+25 (188+2)	150+10	175+25	175+10	225+25 (205+2)	320+25 (325+2)	200+25
Y-axis travel	mm	–	–	–	80(±40)	80(±40)	–	–	-
Z-axis travel	mm	350	380 (350)/700(640)/1,040(1,010)	250	625	555	700 (640)	870 (830)/1,500(1,240)	380/700/1040
E-axis travel	mm	–	–	345	–	660	–	–	-
Tailstock travel type	type	Manual	Manual	–	Manual	–	Manual	Programmable	Manual
Tailstock travel	mm	300	290/610/950	–	610	–	610	810/1,440	290/610/950
Tailstock quill travel type	type	Hydraulic	Hydraulic	–	Hydraulic	–	Hydraulic	Hydraulic	Hydraulic
Tailstock quill diameter	mm	ø50	ø70	–	ø70	–	ø100	ø110	Ø70
Tailstock quill stroke	mm	80	90	–	90	–	100	100	90
Tailstock quill taper	MT	MT-3	MT-4	–	MT-4	–	MT-4	MT-5	MT-4
Rapid traverse rate X-axis	m/min	24	30	24	24	24	30	20	30
Rapid traverse rate Y-axis	m/min	–	–	–	12	12	–	–	-
Rapid traverse rate Z-axis	m/min	24	30	24	24	24	30	20	30
Rapid traverse rate E-axis	m/min	–	–	12	–	12	–	–	-
Spindle speed	rpm	6000	4500	4500 | 6000	4500	4500 | 6000	3500	2000(2 Step)	4500
Spindle nose	type	A2-5	A2-6	A2-6 | A2-5	A2-6	A2-6 | A2-5	A2-8	A2-11	A2-6
Hydraulic chuck diameter	mm	ø169 (6")	ø210 (8")	ø210 sub:ø169	ø210 (8")	ø210 sub:ø169	10"	15"	Ø210
Spindle bore diameter	mm	ø62	ø62 (ø76)	ø62 | ø56	ø62 (ø76)	ø62 | ø56	ø88	ø131	Ø62
Spindle bearing diameter	mm	ø90	ø100 (ø110)	ø100 | ø90	ø100 (ø110)	ø100 | ø90	ø130	ø180	Ø100
Spindle taper	mm	MT-6	1:20	1:20 sub:MT#6	1:20	1:20 sub:MT#6	1:20	1:20	1:20
Live tooling speed	rpm	-	- (4000)	-	3,000	3,000	-(4,000)	- (3,000)	-
No. of tools	set	10	8 (12VDI40)/ (12)	12	12-VDI30	12VDI30	8 (12VDI40)/(12)	12 (VDI60)	8(12)
Standard O.D. tool size	mm	□20	□25	□20	□20	□20	□25	□32	□25
I.D. tool size (Max.)	mm	ø25	ø40	ø25	ø32	ø25	ø40	ø50	Ø40
Tool changing time	sec	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Spindle motor (cont / 30)	kW	7.5/11	15/18.5 (7.5/15)	15/18.5 sub:5.5/7.5	5/9	5/9 sub:5.5/7.5	13/22	22/26	15/18.5
X / Y / Z / E servo motor	kW	1.6(X) /1.6(Z)	3(X)/3(Z)	3/-/3/1.6	3/1.6/3	3/1.6/3/3	3(X)/3(Z)	4(X) /4(Z)	3(X)/3(Z)
Live tool power (cont/30)	kW	-	-(2.2/3.7)	-	3	-	-/ (2.2/3.7)	- (11/15)	-
Positining accuracy X / Y / Z	μm	10(X)/ 10(Z)	10(X)/ 10(Z)	10/10/10	10/10/10	10/10/10	10(X)/ 10(Z)	10(X)/ 25(Z)	10(X)/10(Z)
Repeatability accuracy X / Y / Z	μm	6(X)/ 6(Z)	6(X)/ 6(Z)	6/6	6/ 6/ 6	6/6/6	6(X)/ 6(Z)	6(X)/ 6(Z)	6(X)/6(Z)
Power capacity	KVA	15	25	40	30	45	30	45	25
Coolant tank capacity	ℓ	100	170/165/194	120	165	240	185	200/350	90/165/194
Machine width	mm	2,500	2,564/2,880/3,500	2,920	2,880	3,235	3,425	3,580 (3,680)/4,280(4,380)	2,564/2,880/3,496
Machine depth	mm	1,530	1,580/1,580/1,665	2,010	1,800	2,010	1,770	2,125	1,580/1,580/1,665
Machine height	mm	1,650	1,945 (2,045)/1,945(2,045)/1,870(2,180)	1,967	2,050	2,205	2,220 (2,280)	2,415 (2,550)/2,550	1,944/1,944/1,869
Machine weight	kg	3,100	3,500 (4,000)/4,000(4,500)/4,500(5,000)	4,000	4,500	5,000	6,000	9,550 (10,050)/10,050(11,000)	3,500/4,000/4,500

*Specifications are subject to change without prior notice.

FT series

CNC Turning Center BOXWAY



FT-200 / FT-250 / FT-350 / FT-350AL

MODEL	UNIT	FT-200	FT-250	FT-250SY	FT-350	FT-350AL
Swing over bed	mm	635	635	635	725	725
Swing over cross slide	mm	475	475	475	495	495
Max. turning diameter	mm	330	420	720	620	620
Max. turning length	mm	487	1,037	1,050	1,062	1,520
Bar work capacity	mm	65	77	77 / 51	91	115
Chuck size	inch	8”	10”	10” / 8”	12”	15”
X-axis travel	mm	165 + 10	210 + 20	210+10	310 + 20	310 + 20
Z-axis travel	mm	580	1,120	1,050	1,130	1,630
Max. spindle speed	rpm	4,500	3,500	3,500 / 4,500	3,300	2,000
Spindle nose	type	A2-6	A2-8	A2-8 / A2-6	A2-8	A2-11
Through-spindle hole diameter	mm	76	88	88 / 56	102	131
Spindle bearing inner diameter	mm	110	130	130 / 100	160	180
No.of tools	set	BMT65-12	BMT65-12	BMT 65-12	BMT65-12	BMT65-12
Shank height for square tool	mm	25	25	25	25	25
Shank diameter for boring bar	mm	32	32	32	40	40
Turret indexing time	sec	0.15 / 0.72	0.15 / 0.72	0.15 / 0.72	0.3 / 0.9	0.3 / 0.9
Rapid traverse rate X-axis	mm/min	24,000	24,000	24,000	20,000	20,000
Rapid traverse rate Z-axis	mm/min	24,000	24,000	24,000	20,000	20,000
Tailstock travel	mm	375	900	947	900	1,400
Tailstock spindle diameter	mm	100	100	-	110	110
Tailstock quill stroke	mm	100	100	-	120	120
Taper hole of tailstock spindle	MT	MT-4	MT-4	-	MT-5	MT-5
Main spindle drive motor<cont/30min>	kW	11 / 15	18.5 / 22	18.5 / 22 ; 11 / 15	22 / 30	22 / 26
Rotary tool spindle drive motor<cont./30 min>	kW	3.7 / 5.5	3.7 / 5.5	3.7 / 5.5	3.7 / 5.5	3.7 / 5.5
Servo motors (X / Z)	kW	3 / 3	3 / 3	4 / 4 / 3 / 3	4 / 4	4 / 4
Coolant tank capacity	ℓ	200	250	360	355	420
Floor space	mm	3,560 x 1,950	4,110 x 1,950	5150 x 2135	4,725 x 2,290	5,225 x 2,290
Machine height	mm	1,955	1,955	2,200	2,200	2,200
Machine weight	kg	5,150	6,210	7,550	9,430	10,570

*Specifications are subject to change without prior notice.

HT series

CNC Turning Center Box Way



HT-30MC / HT-30Y / HT-30SY / HT-40Y

MODEL	UNIT	HT-30Y	HT-30MC	HT-30SY	HT-40Y
Swing over bed / Front door	mm	610	610	610	610
Swing over saddle	mm	610	610	610	610
Max. turning diameter	mm	356	356	356	356
Standard turning diameter	mm	275	275	275	275
Max. turning length	mm	705	705	705	705
Bar work capacity	mm	78	78	78 / 44	90
X-axis travel	mm	260	260	260	260
Y-axis travel	mm	100 (±50)	---	100 (±50)	100 (±50)
Z-axis travel	mm	795	795	795	795
Spindle speed	rpm	3,500	3,500	Main Spindle : 3,500 / Sub Spindle : 6,000	3,000
Spindle nose type	type	JIS A2-8	JIS A2-8 (A2-6)	Main Spindle : A2-8 / Sub Spindle : A2-5	JIS A2-8
Hole through spindle	mm	88 (76)	88 (76)	Main Spindle : 88 / Sub Spindle : 56	102
Min. indexing degree		0.001°	0.001°	0.001°	0.001°
Spindle bearing inner diameter	mm	130	130	130 / 90	160
Chuck size	inch	10"	10"	10" / 6"	12"
No.of tools	set	BMT65, 12	BMT65, 12	BMT65, 12	BMT65, 12
Shank height for square tool	mm	25	25	25	25
Shank diameter for boring bar	mm	40 (50)	40 (50)	40 (50)	40 (50)
Live tooling diameter	mm	20 (26)	20 (26)	20 (26)	20 (26)
Turret indexing time	sec	0.25	0.25	0.25	0.25
Live tooling speed	rpm	6,000	6,000	6,000	6,000
Rapid traverse rate	mm/min	X, Z: 30,000 Y: 10,000	X, Z: 30,000 Y: None	X, Z, E: 30,000	X, Z: 30,000 Y: 10,000
		E: 7,000 C: 80 rpm	E: 7,000 C: 80 rpm	Y: 10,000 C: 80 rpm	E: 7,000 C: 80 rpm
Tailstock travel	mm	734	734	734	734
Tailstock quill diameter	mm	80	80	-	80
Tailstock quill inside taper		Live Center (MT5)	Live Center (MT5)	-	MT-5
Spindle motor	kW	13 / 22	13 / 22	13 / 22 / 7.5 / 11	22 / 30
Live tooling motor	kW	7	7	7	7
Servo motors (X / Y / Z / E)	kW	4 / 4 / 4 / 3	4 / None / 4 / 3	4 / 4 / 4 / 3	4 / 4 / 4 / 3
Power capacity	KVA	50	45	50	50
Coolant tank capacity	ℓ	265	265	265	265
Floor space	mm	3,600 x 1,950	3,600 x 1,950	3,600 x 1,950	3750 x 1950
Machine height	mm	2,190	2,190	2,190	2,190
Machine weight	kg	6,200	6,000	6,500	6,700

*Specifications are subject to change without prior notice.

FVT series

CNC VERTICAL LATHE HEAVY DUTY



FVT-450 / FVT-600(MC) / FVT-800 /
FVT-1000(MC) / FVT-1600

MODEL	UNIT	FVT450	FVT600(MC)	FVT800	FVT1000(MC)	FVT1600
Max. swing diameter	mm	650	710	900	1,100	2,000
Swing over saddle	mm	510	510(500)	650	780	-
Max. turning diameter	mm	460	600(530)	800	1,000	2,000
Max. turning length	mm	500	650(585)	760	850	1,250
Work table diameter	mm	-	-	-	-	1,600
Max. workpiece weight	kg	-	-	-	-	8,000
X axis travel	mm	250	305(270)	425	540	1,160
Z axis travel	mm	500	650	760	850	900
W axis travel	mm	-	-	-	-	600
W-axis positioning step(pitch 200mm)		-	-	-	-	4
Rapid traverse rate X-axis	min	24,000	20,000	20,000	20,000	12,000
Rapid traverse rate Z-axis	min	24,000	24,000	20,000	20,000	10,000
Servo motors(X/Z)	kW	3/4	3/4	4/7	4/7	9/7
Spindle nose	type	A2-8	A2-11	A2-11	A2-15	-
Spindle speed	rpm	2,500	2,000	2,000	1,500	2-250
Chuck size	mm	305	381	450	810	-
Through spindle hole dia	mm	57	57	70	90	-
Spindle bearing inner diameter	mm	130	140	160	200	-
Spindle motor	kW	18.5/22	18.5/22	22/30	37/45	37/45
Ram cross section	mm	-	-	-	-	220X220
ATC	type	Turret	Turret(BMT65)	Turret	Turret (BMT85)	Carousel
No. of tools	set	8(12)	8(12)	12	12	12
Shank height for square tool	mm	□32(25)	□32(25)	□32	□32	□32
Shank diameter for boring bar	mm	Ø50	Ø50	Ø60	Ø80	-
Max. rotary tool speed	rpm	-	4,000(MC)	-	3,000(MC)	-
Rotary tool drive motor	kW	-	3.7/5.5(MC)	-	7.5/11(MC)	-
Type of tool shank		-	-	-	-	7/24＃BT50
Max. tool length	mm	-	-	-	-	450
Max.tool weight	kg	-	-	-	-	50
Turret indexing time (adjacent tool)	sec	0.6	0.6	0.2	0.2	40
Turret indexing time (180 deg)	sec	1.85	1.85	1	1	40
Fanuc		0i TF	0i TF	0i TF	0i TF	0i TF
Machine height	mm	3,300	3,450	3,750	3,550	5,810
Floor space	mm	3,400X1,600	3,400X1,800	4,055X2,210	4,010X2,450	5,235X4,280
Machine weight	kg	7,000	9,000	15,000	18,000	23,500

*Specifications are subject to change without prior notice.

VFP series

VERTICAL MACHINING CENTER



VFP-800(A) / VFP-1000(A) / VFP-1300(A)

MODEL	UNIT	VFP-800(A)	VFP-1000(A)	VFP-1300(A)
X Axis Travel	mm	820	1020	1300
Y Axis Travel	mm	520	520	610
Z Axis Travel	mm	505	505	560
Spindle Nose To Table Surface	mm	100-605	80-585	125-685
Spindle Center To Column Surface	mm	560	560	640
Table Dimension	mm	950x520	1150x520	1420x600
Max.loading Wetght	kg	800	800	1500
T-slots (W×no.×p)	mm	18x5x100	18x5x100	18x5x100
Spindle Speed	rpm	10000	10000	10000
Spindle Taper		7/24 taper NO.40	7/24 taper NO.40	7/24 taper NO.40
Dia. Of Spindle	mm	Ø 70	Ø 70	Ø 70
Spindle Motor	kw	7.5/11	7.5/11	7.5/11
Rapid Traverse X Axis	m/min	36	36	32
Rapid Traverse Y Axis	m/min	36	36	24
Rapid Traverse Z Axis	m/min	30	30	24
No. Of Tools		22 (24) (Arm)	22 (24) (Arm)	22 (24) (Arm)
Pull Stud		P-40T (45°)	P-40T (45°)	P-40T (45°)
Max. Tool Weight	kg	8	8	8
Max. Tool Length	mm	300	300	250
Max. Tool Diameter	mm	Ø 80	Ø 80	Ø 80
Max. Tool Diameter (No Adjacent Tool)	mm	Ø 150	Ø 150	Ø 150
Tool Changing Time (Tool To Tool)	sec/Hz	1.7/60	1.7/60	1.7/60
Floor Space	mm	2905×2300	3040×2300	3550×2370
Machine Weight	kg	5800	6300	7100
Max. Machine Height	mm	2800	2800	2665
Power Capacity	KVA	30	30	30
Air Source	bar	6~8	6~8	6~8

*Specifications are subject to change without prior notice.

VMP series

VERTICAL MACHINING CENTER



VMP-23(A) / VMP-23Aapc / VMP-30(A) / VMP-32(A) / VMP-32Aapc
VMP-40(A) / VMP-45(A) / VMP-50(A) / VMP-65(A)

MODEL	UNIT	VMP-23(A)	VMP-23Aapc	VMP-30(A)	VMP-32(A)	VMP-40(A)	VMP-45(A)		VMP-50(A)		VMP-65(A)
							BT40	BT50	BT40	BT50	BT40
X - axis travel	mm	580		760	820	1,020	1,100		1,300		1,650
Y - axis travel	mm	420			520		610				800
Z - axis travel	mm	510			505(Opt.635)		600				800
Spindle nose to table surface	mm	80 ~ 590	135 ~ 645	80 ~ 590	100 ~ 605	80 ~ 585	135 ~ 735		120 ~ 720		70~870
Spindle center to column surface	mm	455			560		660				850
Table surface to floor	mm	820	915	820	920	940	960		975		1,080
Table center to column surface	mm	245 ~ 665			300 ~ 820		355 ~ 965				450~1,250
Table dimensions	mm	650 x 420	580 x 410	890 x 420	520 x 950	520 x 1,150	1,200 x 600		1,420 x 600		1,700×800
Max.loading weight	kg	300	120	300	800		1,500				
T - slot (WxNo.xP)	mm	14 x 4 x 100	35-M12 x P1.75	14mm x 4 x 100	18 x 5 x 100		18 x 5 x 100				18×6×125
Spindle speed	rpm	10,000					10,000	4,000	10,000	4,000	10,000
Spindle taper	type	7/24 taper No.40					7/24 taper No.40	7/24 taper No.50	7/24 taper No.40	7/24 taper No.50	7/24 taper No.40
Spindle motor	kW	7.5 / 11					7.5/11				15/18.5
X - axis rapid traverse rate	m/min	36			40		36				
Y - axis rapid traverse rate	m/min	36			40		36				
Z - axis rapid traverse rate	m/min	36			30		24				
Tool changing time (tool-to-tool) Carrousel	type	7 sec / 60 Hz, 7.1 sec / 50.Hz					7 sec / 60 Hz, 7.1 sec / 50 Hz				
Tool changing time (tool-to-tool) Arm	type	1.7 sec / 60 Hz, 2.0 sec / 50 Hz					1.7 sec / 60 Hz, 2.0 sec / 50 Hz				
Tool changer	type	Carrousel (Arm type)	(Arm type)	Carrousel (Arm type)							
No. of tools	set	18 (20)	20	18 (20)	22 (24)		24				22(24)
Pull stud	type	P-40T (45°)					P-40T (45°)	P-50T (45°)	P-40T (45°)	P-50T (45°)	P-40T(45°)
Max. tool weight	kg	7			8		8	15	8	15	8
Max. tool length	mm	250			300		300	350	300	350	300
Max. tool diameter	mm	Ø80					ø80	ø100	ø80	ø100	ø80
Max. Tool diameter (no adjacent tool)	mm	Ø130			Ø150		ø150	ø200	ø150	ø200	ø150
Floor space	mm	1,900 x 2,355	1,900 x 2,730	2,100 x 2,355	2,905 x 2,260	3,040 x 2,260	3,180 x 2,800		3,550 x 2,800		4,400×3,500
Machine weight	kg	3,000	3,900	3,300	5,800	6,300	6,800		7,300		12,300
Max. machine height	mm	2,370	2,520	2,370	2,800	2,800	2,900				3,300
Power capacity	KVA	30			35		30				30
Air source	bar	6 ~ 8			6 ~ 8						

*Specifications are subject to change without prior notice.

VMX series

VERTICAL MACHINING CENTER



VMX-820/ VMX-1020

MODEL	UNIT	VMX-820 / 1020
X - axis travel	mm	820 / 1020
Y - axis travel	mm	520
Z - axis travel	mm	560
Spindle nose to table surface	mm	140-700
Table surface to floor	mm	920 /940
Table dimensions	mm	250x520 / 1150x520
Max.loading weight	kg	800
T - slot (WxNo.xP)	mm	18x5x100
Spindle speed	rpm	12000
Spindle taper	type	7/24 taper No.40
Dia. of spindle	mm	70
Spindle motor	kW	7.5(11)
X - axis rapid traverse rate	m/min	40
Y - axis rapid traverse rate	m/min	40
Z - axis rapid traverse rate	m/min	30
No. of tools	set	24
Pull stud	type	P-40T(45°)
Max. tool weight	kg	8
Max. tool length	mm	300
Max. tool diameter	mm	75
Max. Tool diameter (no adjacent tool)	mm	150
Tool changing time Tool to tool	type	1.7
Tool changing time Chip to chip	type	4
Floor space	mm	2,905 x 2,352 / 3,040 x 2,352
Machine weight	kg	5,400 / 5,900
Max. machine height	mm	3,060
Power capacity	KVA	30
Air source	bar	6-8

*Specifications are subject to change without prior notice.

HV series

VERTICAL
MACHINING CENTER
HIGH TECH



HV-32A / HV-32Aapc / HV-40A / HV-50A

MODEL	UNIT	HV-32A	HV-32Aapc	HV-40A	HV-50A
X - axis travel	mm	800	800	1,000	1,300
Y - axis travel	mm	520	520	520	610
Z - axis travel	mm	505	505	505	600
Spindle nose to table surface	mm	130 ~ 635	148 ~ 653	100 ~ 605	70 ~ 670
Spindle center to column surface	mm	560	560	560	660
Table surface to floor	mm	940	1,025	970	1025
Table center to column surface	mm	300 ~ 820	300 ~ 820	300 ~ 820	370 ~ 980
Table dimensions	mm	950 x 520	500 x 700	1,150 x 520	1420 x 600
Maximum loading weight	kg	800	200	800	1500
T - slot (W x No. x P)	mm	18 x 5 x 100	35-M16 x P2.0	18 x 5 x 100	18 x 5 x 100
Spindle speed	rpm	10,000	10,000	10,000	10,000
Spindle taper	type	7/24 taper No.40	7/24 taper No.40	7/24 taper No.40	7/24 taper No.40
Spindle motor	kW	15 / 18.5	15 / 18.5	15 / 18.5	15 / 18.5
X - axis rapid traverse rate	m/min	60	60	60	48
Y - axis rapid traverse rate	m/min	60	60	60	48
Z - axis rapid traverse rate	m/min	30	30	30	24
Tool changer	type	Arm Type	Arm Type	Arm Type	Arm Type
No. of tools	set	24	24	24	24
Pull stud	degree	P-40T (45˚)	P-40T (45˚)	P-40T (45˚)	P-40T (45˚)
Max.tool weight	kg	8	8	8	8
Max.tool length	mm	300	300	300	300
Max.tool diameter	mm	80	80	80	80
Max.tool diam. (No Adja ent tool)	mm	150	150	150	150
Tool changing time (Tool-to- tool)	sec (kg)	1.7 (6)	1.7 (6)	1.7 (6)	1.7 (6)
Floor space	mm	2,905 x 2,260	3,300 x 3,175	3,040 x 2,260	3,550 x 2,800
Machine weight	kg	6,850	8,050	7,150	7,300
Max. machine height	mm	2,850	2,980	2,850	2,900
Coolant tank capacity	ℓ	300	270	300	310
Power capacity	KVA	30	30	30	30

*Specifications are subject to change without prior notice.

NBP series

VERTICAL
MACHINING CENTER
BOX WAY



NBP / 1000(A) / 1100(A) / 1300(A)

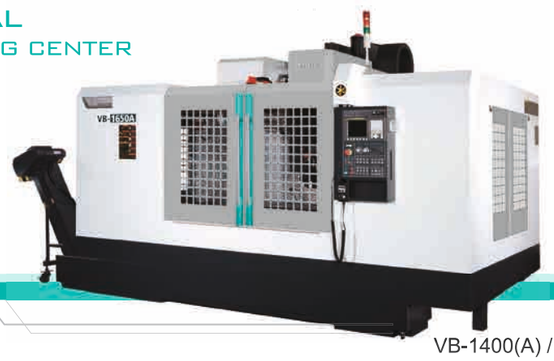
* Gearhead

MODEL	UNIT	NBP-1000(A)		NBP-1100(A)		NBP-1300(A)	
		BT-40	BT-50	BT-40	BT-50	BT-40	BT-50
X axis travel	mm	1,000		1,100		1,300	
Y axis travel	mm	610		610		610	
Z axis travel	mm	600		600		600	
Spindle nose to table surface	mm	110 ~ 710		125 ~ 725		125 ~ 725	
Spindle center to column surface	mm	660		660		660	
Table surface to floor	mm	985		860		860	
Table center to column surface	mm	355 ~ 965		355 ~ 965		355 ~ 965	
Table dimension	mm	1,150 x 600		1,300 x 600		1,500 x 600	
Max. loadind weight	kg	1,000		1,300		1,300	
T-slot (W x No. x P)	mm	18 x 5 x 100		18 x 5 x 100		18 x 5 x 100	
Spindle speed	rpm	10,000(*8000)	4,000(*8000)	10,000(*8000)	4,000(*8000)	10,000(*8000)	4,000(*8000)
Spindle nose	type	7/24 Taper No.40	7/24 Taper No.50	7/24 Taper No.40	7/24 Taper No.50	7/24 Taper No.40	7/24 Taper No.50
Spindle diameter	mm	Ø 70(*Ø85)	Ø 100(*Ø85)	Ø 70(*Ø85)	Ø 100(*Ø85)	Ø 70(*Ø85)	Ø 100(*Ø85)
Spindle motor	kW	7.5 / 11	15 / 18.5	7.5 / 11	15 / 18.5	7.5 / 11	15 / 18.5
Rapid traverse X axis	m/min	24		24		24	
Rapid traverse Y axis	m/min	24		24		24	
Rapid traverse Z axis	m/min	24		24		24	
Tool changer	type	Carrousel(Arm Type)		Carrousel(Arm Type)		Carrousel(Arm Type)	
No.of tools	set	22(24)	(24)	22(24)	(24)	22(24)	(24)
Pull stud	type	P-40T(45°)	P-50T(45°)	P-40T(45°)	P-50T(45°)	P-40T(45°)	P-50T(45°)
Max. tool weight	kg	8	15	8	15	8	15
Max. tool length	mm	300	350	300	350	300	350
Max. tool diameter	mm	Ø 80	Ø 100	Ø 80	Ø 100	Ø 80	Ø 100
Max. tool diameter(no adjacent tool)	mm	Ø 150	Ø 200	Ø 150	Ø 200	Ø 150	Ø 200
Tool changing time (tool to tool) carrousel	sec/Hz	7 / 60 7.1 / 50	3.5/60 5.5/50	7 / 60 7.1 / 50	3.5/60 5.5/50	7 / 60 7.1 / 50	3.5/60 5.5/50
Tool changing time (tool to tool) Arm	sec/Hz	1.7 / 60 2.0 / 50		1.7 / 60 2.0 / 50		1.7 / 60 2.0 / 50	
Floor space	mm	3,290 x 2,290		3,410 x 2,685		3,650 x 2,740	
Machine weight	kg	7,000		7,500		8,000	
Max. machine height	mm	2,900 (*3,030)	3,135 (*3,030)	2,700(*2,930)	3,035(*2,930)	2,700(*2,930)	3,035(*2930)
Power capacity	KVA	30		30		30	
Air source	bar	6 ~ 8		6 ~8		6 ~8	

*Specifications are subject to change without prior notice.

VB series

VERTICAL MACHINING CENTER
BOX WAY



VB-1400(A) / VB-1650(A) / VB-1900(A/) / VB-2200(A)

* Gearhead

MODEL		UNIT	VB-1400(A)		VB-1650(A)		VB-1900A	VB-2200A
X-axis travel		mm	1,400		1,650		1,900	2,200
Y-axis travel		mm	800(4 way)		800(4 way)		860(4 way)	960(6 way)
Z-axis travel		mm	700				800	
Spindle nose to table Surface		mm	145~845				235~1,035	
Spindle center to column surface		mm	850		850		950	1,050
Table dimension		mm	1,650x800		1,900x800		2,100x860	2,400x960
T-slot (W x No. x P)		mm	22x6x125		22x6x125		22x6x125	22x6x160
Max. loading weight		kg	1,500		1,800		2,200	2,700
Spindle speed		rpm	4,000(OPT:6,000) (*6,000)	8,000	4,000(OPT:6,000) (*6,000)	8,000	4,000(OPT:6,000) (*6,000)	
Spindle taper		type	7/24 Taper No.50	7/24 Taper No.40(OPT)	7/24 Taper No.50	7/24 Taper No.40(OPT)	7/24 Taper No.50	
Spindle motor		kW	7.5 / 15 (*18.5 / 22)				11 / 18.5 (*18.5 / 22)	
Rapid traverse rate (X / Y / Z axis)		m/min	20 / 20 / 18				15 / 15 / 12	
Cutting feedrate		m/min	15				12	
Tool changing time	Arm type	sec / Hz	3.5 / 60	1.7 / 60	3.5 / 60	1.7 / 60	3.5 / 60	
(tool-to-tool)	Carrousel type	sec / Hz	9 / 60	8 / 60	9 / 60	8 / 60	-	
Tool changer		type	Arm type (Carrousel type)				Arm type	
No. of tools		set	24 / (20)	24 / (22)	24 / (20)	24 / (22)	32(OPT:40)	
Pull stud		type	P-50T(45°)	P-40T(45°)	P-50T(45°)	P-40T(45°)	P-50T(45°)	
Max. tool weight		kg	15 / (15)	8 / (6)	15 / (15)	8 / (6)	15	
Max. tool length		mm	300	250	300	250	300	
Max. tool diameter		mm	Ø100	Ø80	Ø100	Ø80	Ø100	
Max. tool weight (no adjacent tool)		mm	Ø200	Ø150	Ø200	Ø150	Ø200	
Floor space		mm	4,665x3,175		4,790x3,175		5,150x3,770	5,450x3,770
Machine weight		kg	12,000		13,000		19,000	22,000
Max. machine height		mm	3,300				3,565	
Power capacity		KVA	35				35	
Air source		bar	6~8					

*Specifications are subject to change without prior notice.

U series

5-AXIS VERTICAL MACHINING CENTER



U-250 / U-600P / U-800 / U-1000 / UB-660

MODEL		UNIT	U-250	U-600P	U-800	U-1000	UB-660
X axis travel		mm	350	460	800	1,250	1,250
Y axis travel		mm	300	620	935	1,250	700
Z axis travel		mm	250	400	640	1,000	820(V) / 950(H)
Rotary axis rotation angle		degree	0°~360°	0°~360°	0°~360°	0°~360°	DDM 0°~360°
Tilting axis rotation angle		degree	+120° ~ -120°	+110° ~ -90°	+120° ~ -120°	+30° ~ -180°	DDM +110° ~ -110°
Spindle nose to table surface Z axis	Vertical spindles =0	mm	135-385	150-550	80-725	120-1,240	920
	Horizontal spindles =180		-	-	-	20-1,020	950
Table surface to floor		mm	860 ± 5	750 ± 5	900 ± 5	1,462 ± 5	930
Table dimension		mm	Ø250	Ø600	Ø800	1,000x1,000	Ø660
Table hole dimensions		mm	Ø20 H7	Ø60 H7	Ø60 H7	Ø55 H7	Ø50 H7
T slots		mm	6x12	5x14	7x14	M20x2.5	5x18
Max. table load		kg	100	350	1,200	2,000	1,000
Working torque	Rotary axis	N-m	600	613	1,230	846	300
	Tilting axis		1,800	3,108	3,340	1,720	993
Max. rotation speed	Rotary axis	min^{-1}	66.7	25	100	11	85
	Tilting axis	min^{-1}	33.3	25	50	138	50
Max. diameter of workpiece		mm	Ø350×250(H)	Ø600×400(H)	Ø800×640(H)	Ø1,000×1,600(H)	Ø1,000×720(H)
Spindle speed		min^{-1}	Direct-drive type 10,000	Direct-drive type 10,000	Direct-drive type 12,000	Built-in spindle 8,000	Built-in spindle 12,000
Spindle taper		-	7/24 Taper NO.30	7/24 Taper NO.40	7/24 Taper NO.40	7/24 Taper NO.50	1:10 Taper
Spindle power		Kw	3.7 / 5.5	7.5 / 11	20 / 37	28 / 50	29.5 / 37
X-axis rapid traverse		m/min	36	30	48	50	50
Y-axis rapid traverse		m/min	36	30	48	50	50
Z-axis rapid traverse		m/min	36	30	48	50	50
Tool changing time (tool-to-tool)		sec	4 / 60Hz	7 / 60Hz	10 / 60Hz	3.2 / 60Hz	5 / 60Hz
Tool changer		-	Drum type	Arm type	Drum type	Arm type	Arm type
No. of tools		-	26	24 (30、40、60)	32 (48、64、96、128)	40 (60)	40 (50)
Pull stud		-	P30T（45°）	P-40T (45°)	P-40T (45°)	P-50T (45°)	-
Max. tool weight		Kg	3	7	7	30	7
Max. tool length		mm	150	280	300	500	350
Max. tool diameter		mm	∮60	∮80	∮75	∮125	∮76
Max. tool diameter (No adjacent tool)		mm	∮65	∮150	∮125	∮250	∮150
Floor space		mm	1,725X3,500	3,650X3,500	3,220X4,030	4,680X7,480	6,100X4,000
Machine weight		Kg	4,600	8,600	18,500	38,000	11,000
Max. machine height		mm	2,805	3,000	3,600	4,870	4,000
Power capacity		KVA	25	40	90	150	90
Air source		bar	6~8	6~8	6~8	6~8	6~8

*Heavy tool definition: over 15kg tools. *Specifications are subject to change without prior notice.

EH series

HORIZONTAL MACHINING CENTER
HIGH TECH



EH-320 / EH-320APC

MODEL	UNIT	EH-320	EH-320APC
X-axis travel	mm	300	300
Y-axis travel	mm	320	320
Z-axis travel	mm	270	270
B-axis rotation angle	degree	360	360
Spindle center to table surface	mm	50~320	50~300
Spindle nose to table center	mm	120~390	120~390
Table surface to floor	mm	1,160	1,160
Table dimension	mm	Ø350	320 x 320
Max. loading weight	kg	300	200~500
Screw specifications	type	24-M12 x P1.75	24-M12 x P1.75
Min Indexing angle	degree	90˚(4dposition)	1˚(1/1000˚)
Spindle speed	rpm	10,000	10,000
Spindle nose taper	type	BT-40	BT-40
Spindle motor	kw	5.5 / 7.5	5.5 / 7.5
Rapid traverser rate X Axis	m/min	48	48
Rapid traverser rate Y Axis	m/min	48	48
Rapid traverser rate Z Axis	m/min	48	48
Cutting feedrate	m/min	20	20
No. of tools	set	16	16
Pull stud	type	P40T-1(45˚)	P40T-1(45˚)
Max. tool weight	kg	8	8
Max. tool length	mm	220	220
Max. tool diameter	mm	Ø70	70
Max. tool diameter (No adjacent tool)	mm	Ø120	Ø120
Tool changing time (Tool to tool)	sec (Hz)	1.9(60)	1.9(60)
Number of pallets	set	1	2
Method of pallet change	type	-	Rotary
Pallet change time	sec	-	8
Floor space	mm	1,600 x 2,900	1,600 x 3,400
Machine weight	kg	2,800	3,500
Max. machine height	mm	2,500	2,500
Power capacity	kVA	35	35
Air source	bar	6~8(85 psi)	6~8(85 psi)

*Specifications are subject to change without prior notice.

FMH series

HORIZONTAL MACHINING CENTER



FMH-400 / FMH-500 / FMH-630 / FMH-800 / FMH-1000

MODEL	UNIT	FMH-400	FMH-500 No.40	FMH-500 No.50 (DDS)	FMH-500 No.50 (BELT)	FMH-500Premium No.40	FMH-630	FMH-800	FMH-1000
X-axis travel	mm	610	762	730		762	1,000	1,300	1,300
Y-axis travel	mm	560	710			710	850	1,020	1,020
Z-axis travel	mm	560	710			800	850	1,100	1,100
Spindle center to table surface	mm	50 ~ 610	50 ~ 760			50~760	50 ~ 900	100 ~ 1,120	60~1,080
Spindle nose to table center	mm	130 ~ 690	150 ~ 860	100 ~ 810		100~900	200 ~ 1,050	150 ~ 1,250	150 ~ 1,250
Table surface to floor	mm	1,140	1,200			1,050	1,300	1,475	1,515
Table dimension	mm	400 x 400	500 x 500			500 x 500	630 x 630	800 x 800	1000x1000
Max. loading weight	kg	400	1˚: 500 kg / 0 001˚: 600 kg				1,200	2,000	2,000
Screw specifications	type	M16 x P2	M16 x P2			M16XP2	M16 x P2	M16 x P2	M20xP2.5
Min. indexing degree	deg.	1˚ /OPT : 0.001˚	1˚/OPT: 0.001˚			1˚/ OPT: 0.001˚	1˚ /OPT: 0.001˚	1˚/(OPT: 0.001˚/5˚)	1˚/(OPT: 0.001˚)
Spindle speed	rpm	8,000 / 10,000 (OPT)	8,000 / 10,000 (OPT)	6,000 / 8,000 (OPT)		10,000 / 15,000(OPT)	6,000 / 8,000 (OPT)	6,000 / 8,000 (OPT)	6,000 / 8,000 (OPT)
Spindle taper	type	7/24 Taper No.40	7/24 Taper No.40	7/24 Taper No.50		7/24 Taper no.40	7/24 Taper No.50	7/24 Taper No.50	7/24 Taper No.50
Spindle diameter	mm	Ø85	Ø85	Ø90	Ø100	Ø85	Ø100	Ø110	Ø110
Spindle motor	kW	(Built in)7.5 / 11	(Built in)7.5 / 11	(DDS)15 / 18.5	(Built in)7.5/15	15/18.5(DDS) 18.5/22(Built in)(OPT)	11 / 18.5	22 / 26	22 / 26
Rapid traverse X-axis	m/min	30(60)	30(48)			48(60)	24(42/48)	42	42
Rapid traverse Y-axis	m/min	30(60)	30(48)			48(60	24(42/48)	42	42
Rapid traverse Z-axis	m/min	30(60)	30(48)			48(60	24(42/48)	42	42
Cutting feedrate	m/min	20	20			20	15(20)	20	20
No. of tools	set	40:60/120 (OPT)	40: 60/90 (OPT)		40: 60/90 (OPT)	40:60/120(OPT)	40: 60/90 (OPT)	60 : 90/120 (OPT)	60 : 90/120 (OPT)
Pull stud (degree)	type	P40T-1	P40T-1	P50T-1	P50T-1	P40T-1	P50T-1	P50T-1	P50T-1
Max. tool weight	kg	8	8	20	20	12	20	0~15 | 15~25	0~15 | 15~25
Max. tool length	mm	300	300	500	500	550	500	500	500
Max. tool diameter	mm	Ø85	Ø85	Ø125	Ø125	Ø95	Ø125	Ø125	Ø125
Max. tool diameter (no adjacent tool)	mm	Ø140	Ø140	Ø220	Ø220	Ø190	Ø220	Ø250	Ø250
Tool changing time (tool to tool)	sec (Hz)	2 (60)	2 (60)	8 (60)	8 (60)	1.3(60)	8 (60)	3.5 (60) | 4.7(60)	3.5 (60) | 4.7(60)
Number of pallets	set	2	2			2	2	2	2
Method of pallet change	type	Rotary	Rotary			Rotary	Rotary	Rotary	Rotary
Pallet change time	sec (Hz)	8 (60)	8 (60)			8 (60)	10 (60)	20 (60)	20 (60)
Floor space	mm	2,610 x 4,750	3,050X5,120	3,210 x 5,120	3,210X5,120	3,150 x 5,120	4,130 x 6,624	4,900 x 7,745	4,900 x 7,745
Machine weight (net)	kg	8,500	13,500	15,000	16,000	14,000	19,000	30,000	30,000
Max. machine height	mm	2,730	2,915	3,280	3,280	2,915	3,661	4,060	4,060
Power capacity	KVA	40	40			40	65	70	70
Air source	bar	6~8 (85 psi)	6~8 (85 psi)			6~8 (85 psi)	6~8 (85 psi)	6~8 bar (85 psi)	6~8 bar (85 psi)

*Heavy tool definition: over 15kg tools. *Specifications are subject to change without prior notice.

TC series

DRILLING & TAPPING CENTER



TC-20α

SVW series

DOUBLE COLUMN MACHINING CENTER



SVW-4223

MODEL	UNIT	TC-20α(Arm Type)	TC-20α(Turret Type)
X-axis travel	mm	510	510
Y-axis travel	mm	400	400
Z-axis travel	mm	400	300
Spindle nose to table surface	mm	174~574	174 ~ 474
Table surface to floor	mm	845	845
Table dimension	mm	600 x 400	600 x 400
Max. loading weight	kg	250	250
T-slot	mm	14 x 3 x 125	14 x 3 x 125
Spindle speed	rpm	12,000	12,000
Spindle taper	type	7/24 Taper No.30	7/24 Taper No.30
Spindle motor	kW	3.7 / 5.5	3.7 / 5.5
Rapid traverse X-axis	m/min	48	48
Rapid traverse Y-axis	m/min	48	48
Rapid traverse Z-axis	m/min	48	48
No. of tools	set	20	14
Pull stud	type	P-30T (45°)	P-30T(45°)
Max. tool weight	kg	3/25	3 / 25
Max. tool length	mm	200	200
Max. tool diameter	mm	Ø80	Ø80
Tool changing time (tool-to-tool)	sec (Hz)	1.8	1.8
Floor space	mm	1,700 x 2,285	1,600 x 2,285
Machine weight	kg	2,400	2,400
Max. machine height	mm	2,555	2,555
Power capacity	KVA	15	15
Air source	bar	6 ~ 8	6 ~ 8

*Specifications are subject to change without prior notice.

MODEL	UNIT	SVW 2217	SVW 2817	SVW 3217	SVW 4217	SVW 2822	SVW 3222	SVW 4222	SVW 3223	SVW 4223	SVW 2825	SVW 3225	SVW 4225
Overall size	mm	2000	2600	3000	4000	2600	3000	4000	3000	4000	2600	3000	4000
T slots	mm	1400	1400	1400	1400	1800	1800	1800	2000	2000	2000	2000	2000
Max. loading	mm	22											
TRAVEL	ton	8	9	10	14	11	12	15	12	15	11	12	15
X axis	mm	2200	2800	3200	4200	2800	3200	4200	3200	4200	2800	3200	4200
Y axis	mm	1600				2100					2500		
Z axis	mm	800(OPT 1000)											
Between two columns	mm	1700				2200			2300		2500		
Spindle nose to table top Z=800mm	mm	240~1040											
Spindle nose to table top Z=1000mm	mm	240~1240											
Speed	rpm	6000(4000/8000)											
Taper		BT/DIN/CAT 50(#40)											
Motor(cont/30min/S3-25%)	kw	15/18.5/25 (22/26/35)											
No. of ATC	tools	24(32/40/60)											
Max. Dia of tool	mm	24T : ø 110 (with Adjacent Tool) ， ø 200 (without Adjacent Tool) / OPT : 32T/40/60 ø125(with Adjacent Tool) ， ø 250 (without Adjacent Tool)											
Max. length of tool	mm	24T : 350				/ OPT : 32T/40/60 : 400							
Max. tool weight	kg	24T :18				/ OPT : 32T/40/60 : 25							
Rapid feedrate X/Y/Z	m/min	15/15/15		12/15/15		15/15/15	12/15/15						
Cutting feedrate	mm/min	1~10000											
Min. Setting	mm	0.001											
Hydraulic tank volume	L	70											
Lubrication tank volume	L	8											
Coolant tank volume	L	584				680					760		
Machine Weight	tons	21	24	26	38	26	32	43	35	45	31	37	48
Power required	kVA	40			50	40		50	40	50			
Compressed air pressure	kg/cm²	7											
Compressed oil pressure	kg/cm²	70											
Floor space Length	mm	6350	7550	8350	10350	7550	8350	10350	8350	10350	7550	8350	10350
Floor space Width	mm	5000				5500			5700		6200		
Controller		FANUC 0i-M (32i-M / 31i-M) MITSUBISHI (M80/M800) 、SIEMENS (840DSL/828D) HEIDENHAIN (TNC 640HSCI)											

*Specifications are subject to change without prior notice.

FDM
series
Double Column
Machining Center



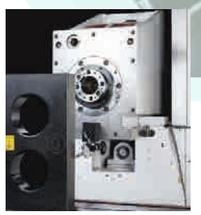
FDM3228~8235

MODEL	UNIT	FDM-3228	FDM-4228	FDM-5228	FDM-6228	FDM-7228	FDM-8228	FDM-4232	FDM-5232	FDM-6232	FDM-7232	FDM-8232	FDM-4235	FDM-5235	FDM-6235	FDM-7235	FDM-8235
TABLE																	
Overall size	mm	3000x2600	4000x2600	5000x2600	6000x2600	7000x2600	8000x2600	4000x2600(3000)	5000x2600(3000)	6000x2600(3000)	7000x2600(3000)	8000x2600(3000)	4000x3000(3300)	5000x3000(3300)	6000x3000(3300)	7000x3000(3300)	8000x3000(3300)
T slots	mm	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22
Max. loading	ton	12(16)	15(21)	18(23)	21(24)	24(27)	27(30)	21(24)	23(26)	24(27)	27(30)	30	24(27)	26(29)	27(30)	27(30)	30
TRAVEL																	
X axis	mm	3200	4200	5200	6200	7200	8200	4200	5200	6200	7200	8200	4200	5200	6200	7200	8200
Y axis	mm	2700(3300)	2700(3300)	2700(3300)	2700(3300)	2700(3300)	2700(3300)	3100(3700)	3100(3700)	3100(3700)	3100(3700)	3100(3700)	3400(4000)	3400(4000)	3400(4000)	3400(4000)	3400(4000)
Z axis	mm	800 (1000、1200、1400)							800 (1000、1200、1400)								
DISTANCE																	
Between two columns	mm	2800	2800	2800	2800	2800	2800	3200	3200	3200	3200	3200	3500	3500	3500	3500	3500
Spindle nose to table top	mm	270~1070 (Z=800) / 270~1270 (Z=1000) / 270~1470 (Z=1200) / 270~1670 (Z=1400)							270~1070 (Z=800) / 270~1270 (Z=1000) / 270~1470 (Z=1200) / 270~1670 (Z=1400)								
SPINDLE																	
Speed	rpm	6000(4000/8000)							6000(4000/8000)								
Motor (cont/30min/S3-25%)	kW	15 / 18.5 / 25(22 / 26 / 35)							15 / 18.5 / 25(22 / 26 / 35)								
Taper		BT/DIN/CAT 50 (#40)							BT/DIN/CAT 50 (#40)								
FEED RATE																	
Rapid feedrate X/Y/Z	mm/min	15/15/12			12/15/12			15/15/12	15/15/12	12/15/12			15/15/12		12/15/12		
Cutting feedrate X/Y/Z	mm/min	1~7000							1~7000								
ATC																	
No. of ATC		24(32/40/60/90)							24(32/40/60/90)								
Max. length of tool	mm	350(STD:24T)/400(OPT:32T/40T/60T/90T)							350(STD:24T)/400(OPT:32T/40T/60T/90T)								
Max. tool weight	kg	18(STD:24T)/25(OPT:32T/40T/60T/90T)							18(STD:24T)/25(OPT:32T/40T/60T/90T)								
Max.Dia of Tool (with adjacent tool)	mm	110(STD:24T)/125(OPT:32T/40T/60T/90T)							110(STD:24T)/125(OPT:32T/40T/60T/90T)								
Max.Dia of Tool (without adjacent tool)	mm	200(STD:24T)/250(OPT:32T/40T/60T/90T)							200(STD:24T)/250(OPT:32T/40T/60T/90T)								
COOLANT & LUBRICATION																	
Coolant tank volume	L	840			980			840	840	980			920		1060		
Hydraulic tank volume	L	70															
Lubrication tank volume	L	8							8								
MISCELLANEOUS																	
Machine weight	ton	45	51	58	73	82	91	56	63	75	86	100	61	68	77	87	106
Power required	kVA	50							50								
Compressed air pressure	kg/cm²	7							7								
Compressed oil pressure	kg/cm²	70							70								
Controller		FANUC 0i-M(32i-M/31i-M) MITSUBISHI (M80/M830) SIEMENS (828D/840DSL) HEIDENHAIN (iTNC 640)							FANUC 0i-M(32i-M/31i-M) MITSUBISHI (M80/M830) SIEMENS (828D/840DSL) HEIDENHAIN (iTNC 640)								

*Specifications are subject to change without prior notice.

SBM
series
CNC Bed Type
Universal Milling Machine











SBM-2000H / 2500H / 3000H / 3500H

MODEL	UNIT	SBM-2000H	SBM-2500H	SBM-3000H	SBM-3500H
TRAVEL					
X-axis travel	mm	2,000	2,500	3,000	3,500
Y-axis travel (Up and Down)	mm	1,200 (1,500)			
Z-axis travel (Forward and Backward)	mm	1,000			
Distance from table top to spindle center	mm	295~1,495 (295~1,795)			
Distance from table center to spindle nose	mm	801~-199			
TABLE					
Overall size	mm	2100×1000	2700×1000	3100×1000	3,600×1000
Max. loading weight	kg	5,000	6,000	7,000	8,000
T-slot	mm	22T×7×125			
Height from floor to table top	mm	1,010			
SPINDLE					
Taper		BT-50			
Speed	rpm	4,000 (6,000)			
Motor (cont/30min / s3-25%)	kW	15/18.5 / 25			
FEED RATE					
Rapid traverse X/Y/Z	mm/min	10,000			
Cutting feedrate	mm/min	1~5,000			
MISCELLANEOUS					
Electrical power supply	kVA	50			
Compressed air pressure	kg/cm²(psi)	6 (85)			
Compressed oil pressure	kg/cm²(psi)	105(1,493)			
Compressed air flow rate	L/min	30			
Hydraulic tank volume	L	105			
Lubricant tank volume	L	8			
Coolant tank volume	L	360			
Controller	-	FANUC 32i-M (31i)			
FLOOR SPACE					
Max. machine height	mm	3,530			
Floor space	mm	4,800x5,560	4,800x6,560	4,800x7,560	4,800x8,560
Machine weight	kg	15,000	16,000	18,800	20,000

*Specifications are subject to change without prior notice.

SBM-2000V/2500V/3000V/3500V

MODEL	UNIT	SBM-2000V	SBM-2500V	SBM-3000V	SBM-3500V
TRAVEL					
X-axis travel	mm	2,000	2,500	3,000	3,500
Y-axis travel (Up and Down)	mm	1,000			
Z-axis travel (Forward and Backward)	mm	1,200 (1,500)			
Distance from table top to spindle center	mm	Horizontal 95~1295 (95~1,545) Vertical 45~1245 (45~1,545)			
Distance from table center to spindle nose	mm	Horizontal 480~-520 Vertical 530~-470			
TABLE					
Overall size	mm	2100×1000	2700×1000	3100×1000	3,600×1000
Max. loading weight	kg	5,000	6,000	7,000	8,000
T-slot	mm	22T×7×125			
Height from floor to table top	mm	1,010			
SPINDLE					
Taper		BT-50			
Speed	rpm	3,500 (4,500)			
Motor (cont/30min / s3-25%)	kW	15/18.5 / 25			
FEED RATE					
Rapid feedrate X/Y/Z	mm/min	10,000			
Cutting feedrate	mm/min	1~5,000			
MISCELLANEOUS					
Electricao power supply	kVA	50			
Compressed air pressure	kg/cm²(psi)	6 (85)			
Compressed oil pressure	kg/cm²(psi)	105 (1,493)			
Compressed air flow rate	L/min	30			
Hydraulic tank volume	L	105			
Lubricant tank volume	L	8			
Coolant tank volume	L	360			
Controller	-	FANUC 32i-M (31i)			
FLOOR SPACE					
Max. machine height	mm	3,530			
Floor space	mm	4,800x5,560	4,800x6,560	4,800x7,560	4,800x8,560
Machine weight	kg	15,000	16,000	18,800	20,000

*Specifications are subject to change without prior notice.

SHM series

CNC Horizontal Boring & Milling Machine



SHM-630L / 800 / 800L

MODEL	UNIT	SHM-630L	SHM-800L	SHM-800
TABLE				
Overall size	mm	630 x 630(700 x 700 / 700 x 900)	800 x 800(800 x 1,000 / 1,000 x 1,000)	800 x 800(800 x 1,000)
T slots	mm	20 x5	22 x7	
Max. loading	kg	1,500	3000	
Table surface to floor	mm	1,130	1,190	1,200
Indexing Degree	°	1° / 360		
Clamping Force	kg-m	5,000		
TRAVEL				
X axis	mm	1 400, (1,200)	1,500	2000
Y axis	mm	1,150 (950)	1,600 (1,180)	1,100(1,500)
Z axis	mm	1,000 (800)	1,200 (1,000)	1,200
DISTANCE				
Spindle Nose to Table Center	mm	300~1,300(300~1,100)	225~1,425(225~1,225)	300~1,500(300~1,700)
Spindle Center to Table Top	mm	0~1,150(0~950)	0~1,600(0~1,200)	0~1,100(0~1,500)
SPINDLE				
Taper	mm	BT/DIN/CAT 50		
Speed	rpm	4,000 (6,000)		
FEED RATE				
Rapid traverse X/Y/Z	m/min	15/15/15	24/24/24	10/10/10
Cutting feedrate	mm/min	1~5,000		
ACT				
No. of ATC	tool	40 (60)		
Max. length of tool	mm	400		
Max. tool weight	kg	35		
Max. Dia of tool	mm	ø125 (with adjacent tool) / -ø245 (without adjacent tool)		
Tool selection		Fixed type		
MOTORS				
Spindle motor(cont/30min/s3-25%)	kW	11 / 15 / 18.5		
X/Y/Z/B motor	kW	3/3/4/4	4/4/4/4	
Lubricator motor	kW	0.025		0.025
MISCELLANEOUS				
Air consumption	g/cm^2	6		
Power required	kkVA	40		
Hydraulic tank volume	L	40	70	
Lubrication tank volume	L	4.6		
Coolant tank volume	L	300	400	
MACHINE DIMENSION				
Machine outline	mm	4,250 x 5,350 x3,200	5,300 x 5,300 x 3,750	6,300 x 6,170 x 3,800
Machine weight	kg	12,000	14,000	14,600

*Specifications are subject to change without prior notice.

SHB series

CNC Horizontal Boring & Milling Machine (Extendable Spindle)



SHB-11025/11030/11040RS / SHB-11030/11040RM
SHB-13025/13030/13040RS / SHB-13030/13040 RM/RL

		Column Fixed	Column Moving											
MODEL	UNIT	SHM-11020RF	SHB-11025RS	SHB-11030RS	SHB-11040RS	SHB-11030RM	SHB-11040RM	SHB-13025RS	SHB-13030RS	SHB-13040RS	SHB-13030RM	SHB-13040RM	SHB-13030RL	SHB-13040RL
TABLE														
Overall size	mm	1,000x1,200	1,400x1,600 (1,600x1,800)			1,800x2,000		1,400x1,600 (1,600x1,800)			1,800x2,000		3,200x1,800	
Max. loading	ton	5	7(10)			15(20)		7(10)			15(20)			
T-slots	mm	22x9	24x7			28x9		24x7			28x9			
Height from ground	mm	1,235	1,228			1,440		1,228			1,440			
B-axis min. increment	°	0.001°	0.001°、±5"											
TRAVEL														
X axis	mm	2,000	2,500	3,000	4,000	3,000	4,000	2,500	3,000	4,000	3,000	4,000	3,000	4,000
Y axis	mm	1,600	1,800 (2,000 / 2,300 / 2,500)											
Z axis	mm	1,200(1,400)	1,500 (1,700)											
W axis	mm	400	500 (700)					700(900)						
Spindle nose to table center	mm	400~1,600	500~2,000 (2,200)			785~2,285 (2,485)		585~2,085 (2,285)			785~2,285 (2,485)			
SPINDLE														
W spindle diameter	mm	110						130						
Speed	rpm	2,500	2,500(3,200)					2,000(2,700)						
Taper	mm	TAPER 7/24												
FEED RATE														
Rapid traverse X/Y/Z	m/min	10 / 10 / 10 / 5	10 / 12 / 12 / 5											
Cutting feedrate	mm/min	1~5,000												
Motor														
Spindle motor(cont/30min/s3-25%)	kW	15 / 18.5 / 22	22 / 26 / 35											
X/Y/Z/W/B axis feed motor	kW	7 / 7 / 7 / 3 / 7	7 / 7 / 9 / 3 / 7			9 / 7 / 9 / 3 / 7		7 / 7 / 9 / 3 / 7			9 / 7 / 9 / 3 / 7			
ACT														
No. of ATC	tools	40(60)												
Taper	-	BT50(CAT50/DIN50)												
Pull stud	-	MAS403-P50T-1(CAT50/DIN50)												
Tool selection	-	fixed type												
Max. tool diameter(adjacent tool)	mm	ϕ 125												
Max. tool diameter(no adjacent tool)	mm	ϕ 245	ϕ 250											
Max. tool weight	kg	35												
Max. length of tool	mm	400												
MISCELLANEOUS														
Power required	kVA	60	60			70		60			70			
Hydraulic tank volume	L	80	110											
Coolant tank volume	L	420	500											
Lubrication tank volume	L	8												
Machine weight	kg	21,000	32,000	33,000	34,000	33,000	34,000	40,000	42,000	46,000	42,000	46,000	47,000	51,000
CNC Controller	-	FANUC/ MITSUBISH/ SIEMENS/ HEIDENHAIN												
Floor space														
Machine height	mm	4,200	4,125(4,325/4,625/4,825)			4,340(4,540/4,840/5,040)		4,125 (4,325/4,625/4,825)			4,340(4,540/4,840/5,040)			
Machine length	mm	6,063	7,184	7,734	8,834	7,490	9,040	7,184	7,734	8,834	7,750	9,040	9,040	10,140
Machine width	mm	6,608	6,526 (7,034)			6,834 (7,034)		6,475 (6,675)			6,800 (6,882)			

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