



FAIR FRIEND • ENGINEERING • EXCELLENCE • LEADERSHIP • EXPERTISE • RELIABILITY



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ISO 9001
ISO 14001



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FMH *SERIES*

Horizontal Machining Center



Quality Features of FMH-500

HORIZONTAL MACHINING CENTER FMH-500

No matter whether it is precision parts machining or general mold machining, the new generation FMH Series horizontal machining center from FEELER will provide you with the outstanding performance that you've come to expect. The FMH Series is carefully designed and engineered for the utmost accuracy.

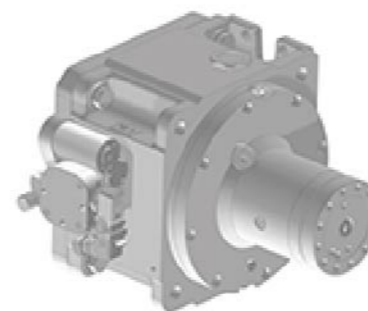
EXCELLENT FOR DIVERSIFIED INDUSTRIES:

- Precision (profiled) Parts Machining
- General Mold Machining
- Automotive and Motorcycle Part Machining
- 3C Industries
- Aerospace Part Machining
- Semi-conductor Industry
- FMC&FMS Unmanned Production Lines



OPTIMAL MACHINE STRUCTURE

- The major structural parts are manufactured from high quality cast iron with extremely uniform metallurgy.
- The T-shaped base is an integrated box-type construction, featuring maximum stability.
- The 3 axes travels are fully supported without overhang problem. This results in outstanding loading capacity and extremely stable workpiece movement.



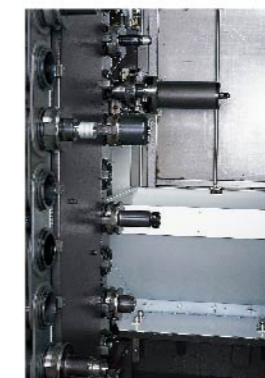
ZF PLANETARY GEARBOX
DUAL RATIO
1:1 & 1:4



DDS

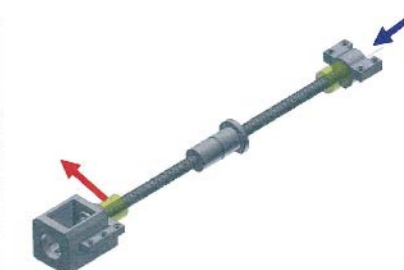
CONVENIENT ATC SERVICING

- The ATC mechanism has sufficient space for convenient repair and maintenance.



SPECIAL RETURN FLOW TILTING CHANNEL

When tool change is accomplished, the oil dust and chips will flow back to the machine base via the specially designed tilting channel. This may eliminate environmental pollution problem.



Coolant Through Ball Screw
3 axes feedrate 48M / 60M (Optional)

HORIZONTAL MACHINING CENTER FMH-500 Premium

OUTSTANDING PERFORMANCE: (OPT)

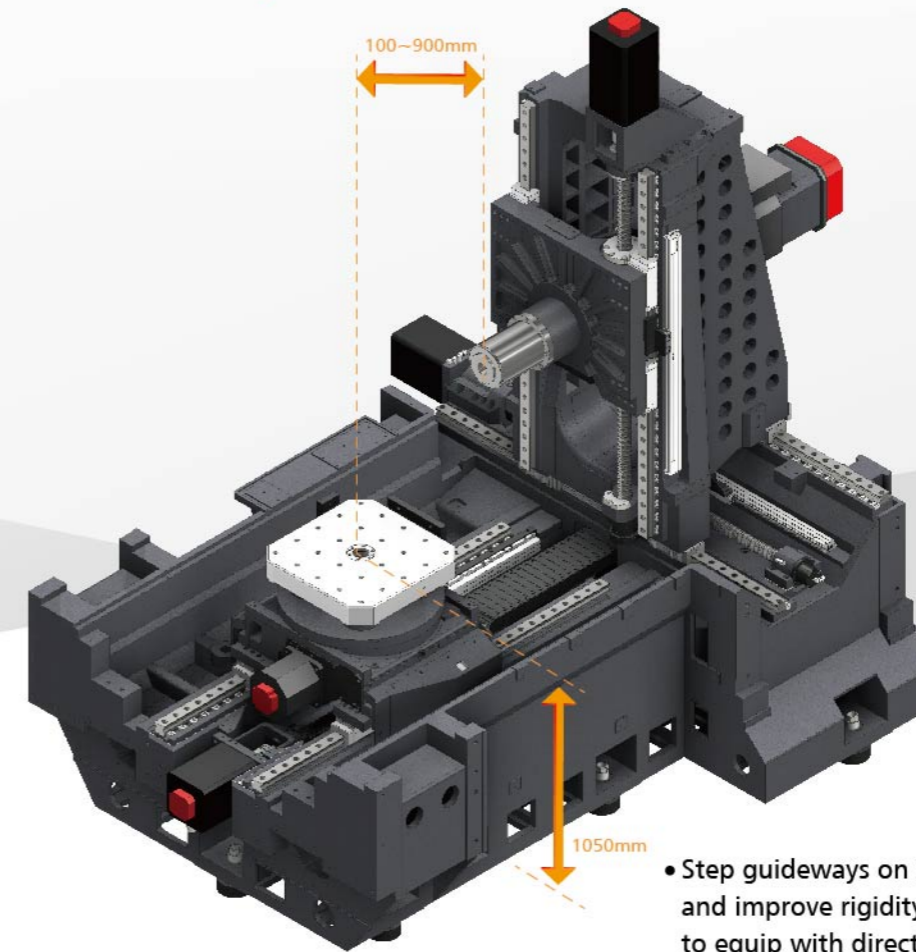
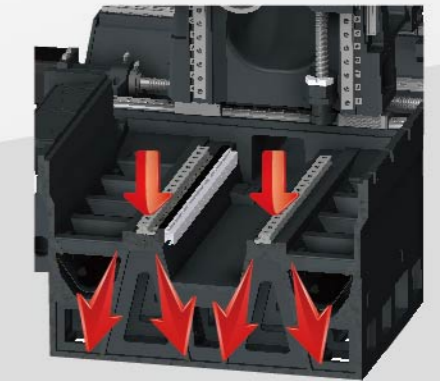
- Precision(profiled) Parts Machining.
- Fast / Durable / Reliable
- Automobile / Aerospace / Medical
- 1 G acceleration.
- 60 m/min X/Y/Z rapid traverse.
- Industry 4.0
- FMS production line.



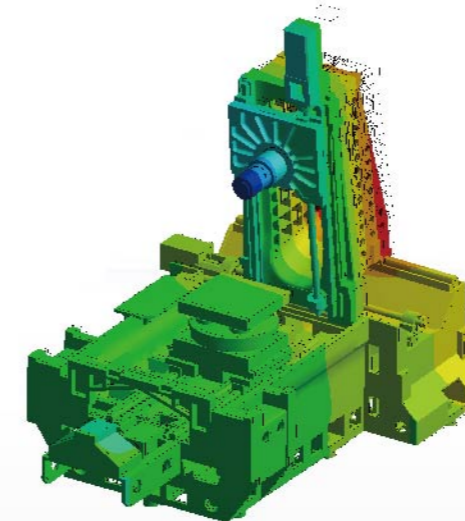
Quality Features of New FMH-500

Highlighted Features

Enhanced rigidity realized by low gravity center, 3-point support
Effectively improved model of high rigidity, high durability and high precision.

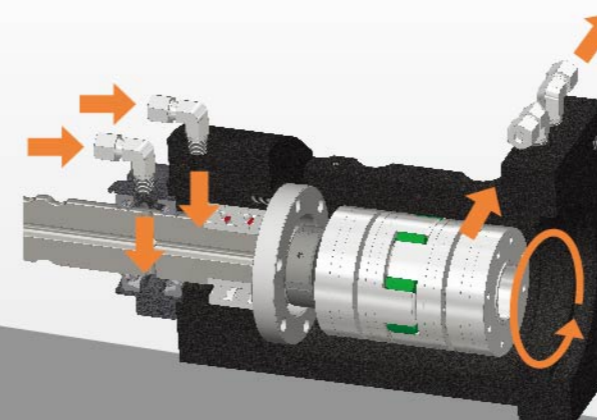


- Step guideways on X-axis to increase stable axial movement and improve rigidity. Reduced column height provides flexibility to equip with direct drive or built-in spindle to meet different machining requirements
- User-friendly floor-to-table height minimized to 1050mm



Finite Element Method

Fair Friend utilizes Finite Element Method (FEM) software for rigidity and FEM analysis. The end result is superior machines with optimum combination of structure, price/performance ratio, accuracy and reliability.

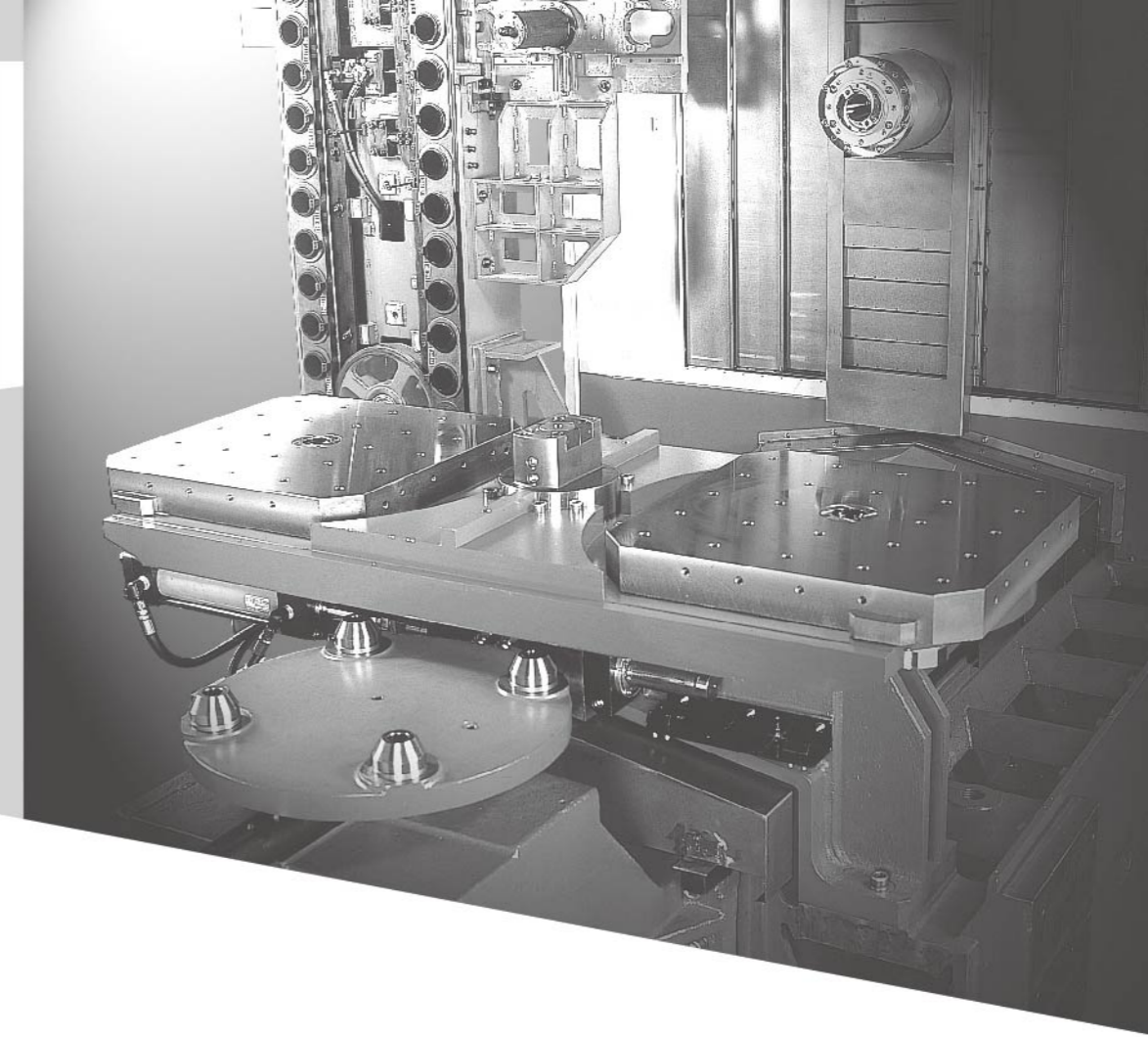
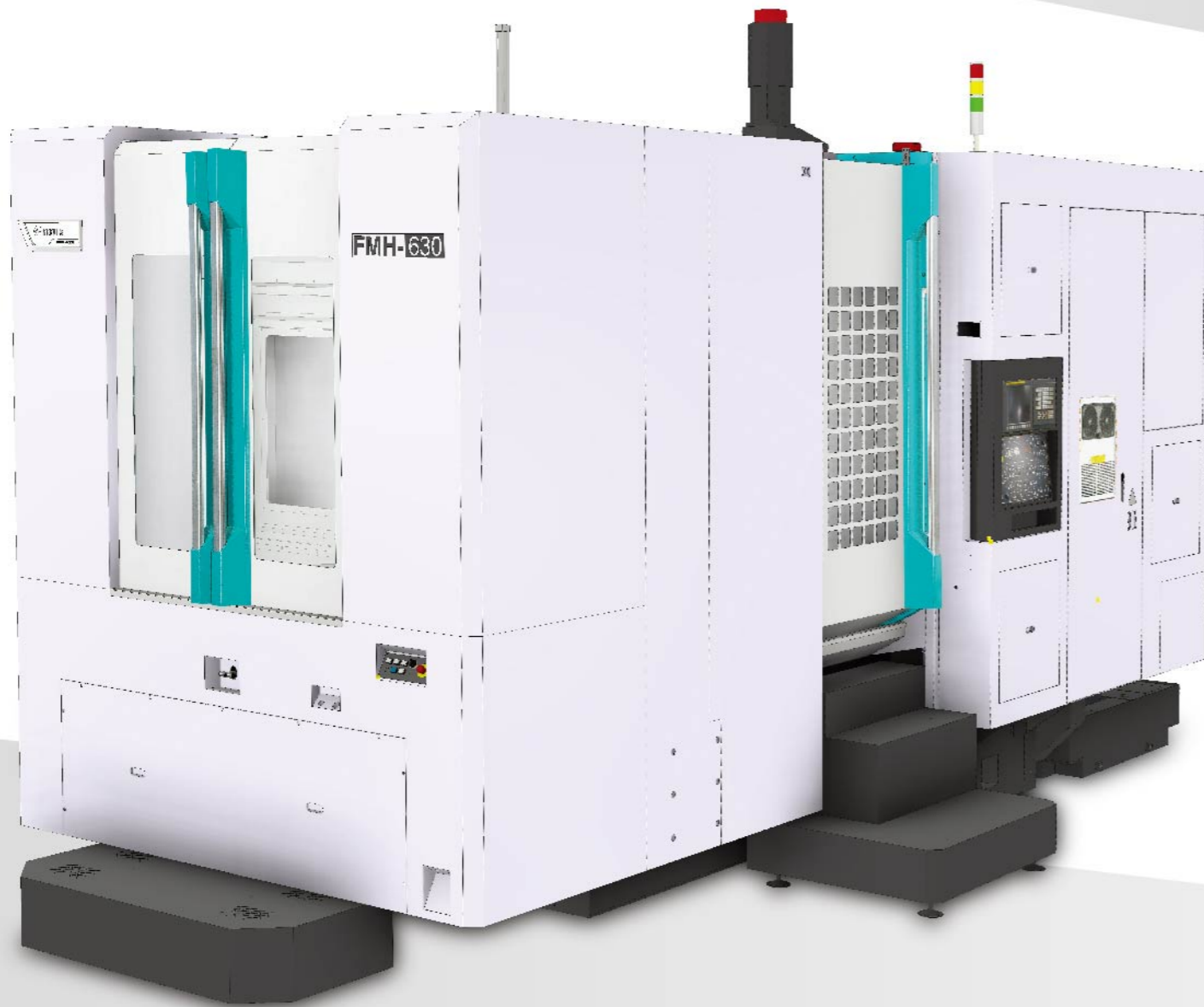


Three-axis Thermal Expansion Errors Compensation : (OPT)

- Motors for 3 axes are installed outside of casting body, motor housing equipped with frequency converter cooling circulation system. This insulates the casting parts and machine structure from heat resources to reduce thermal deformation .
- Forced lubrication and cooling system on 3 axes extends bearing lifetime and increases accuracy .
- Frequency converter cooling circulation system for 3-axis ball screws reduces thermal positioning errors while enhances accuracy and lifetime.



HORIZONTAL MACHINING CENTER FMH-630



The Feeler FMH-630 is designed and engineered with efficiency, stability and heavy duty in mind. It is a machining center excellent for precision mold machining and heavy parts machining.

The brand new design concept of FMH series horizontal machining centers are dedicated to machine both mass production parts and general molds with high accuracy. The outstanding performance of FMH series machines from FEELER brings you the utmost cutting efficiency as well as maximum profitability.



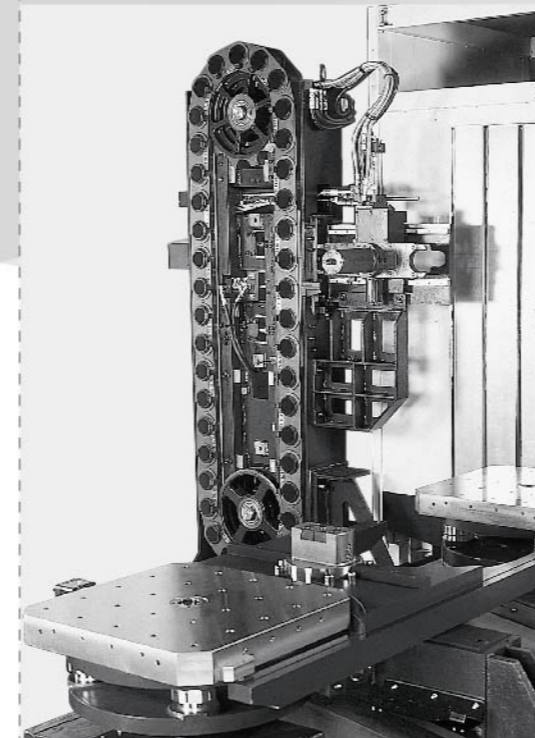
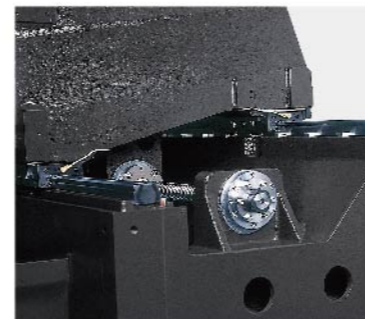
Quality Features of FMH-630

SPECIAL HIGH/LOW LINEAR WAYS CONSTRUCTION

- The T-shaped base is an integrated 3-layer box-type construction combined with rib reinforcement to maximize the rigidity and stability of the machine.
- The housing-type double-wall column is ruggedly constructed to assure high accuracy during heavy-duty machining.
- The base is specially designed with high/low linear ways, which effectively shorten force loading lines while greatly increasing machining stability.

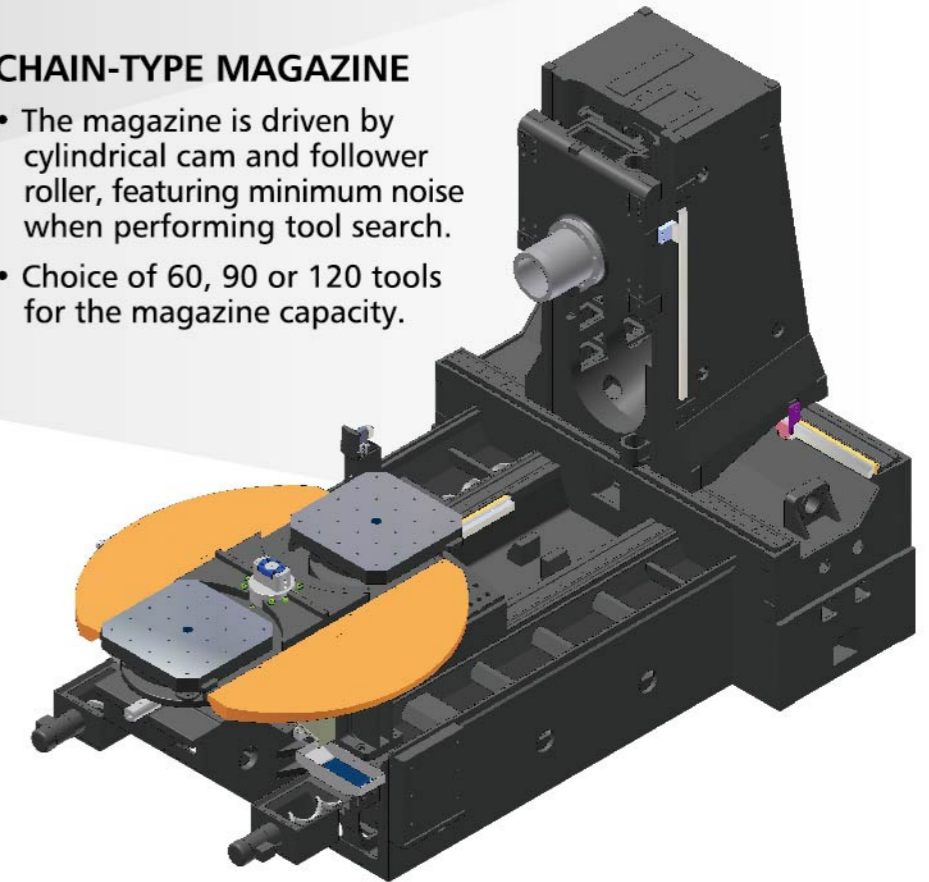
THREE AXES LINEAR WAYS RESISTS HEAVY LOADS

- Three axes are fully equipped with linear guide ways, combined with double rows support at both sides, for increased loading capacity, high rigidity and high accuracy. No further maintenance is required for long term operations.



CHAIN-TYPE MAGAZINE

- The magazine is driven by cylindrical cam and follower roller, featuring minimum noise when performing tool search.
- Choice of 60, 90 or 120 tools for the magazine capacity.



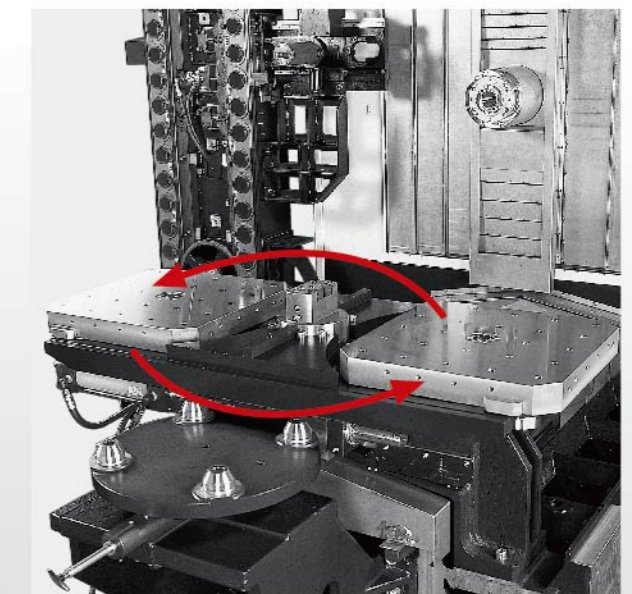
OVERSIZED TAPERED CONES

The B axis movement and Z axis cross movement are equipped with oversized tapered cones for extremely accurate pallet positioning. This assures outstanding machining accuracy.

SWING-TYPE AUTOMATIC PALLET CHANGER (APC)

Designed with one-to-one swing-type automatic pallet change. The APC features rigid construction, high positioning accuracy and fast change.

- Maximum table loading capacity up to 1,200 kg.
- Maximum table diameter $\varnothing 950$ mm.
- Fastest change time is 10 seconds.



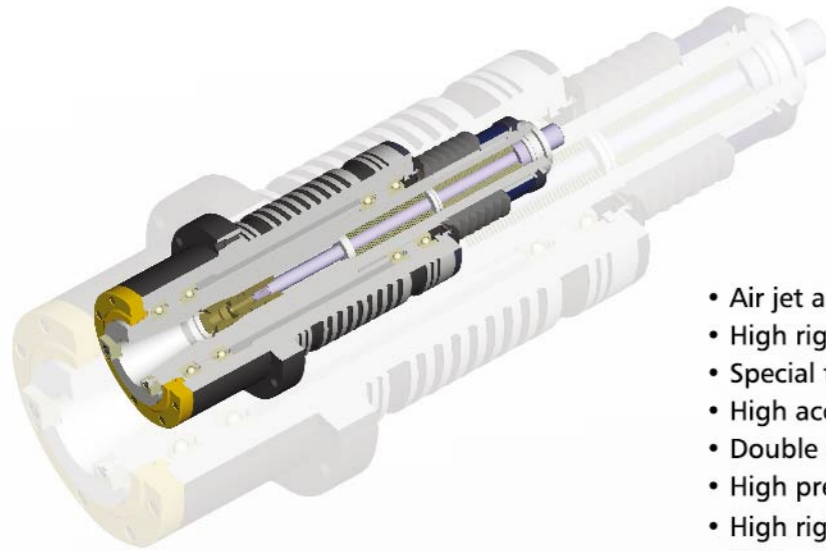
HORIZONTAL MACHINING CENTER FMH-800/1000

Machine Features

- T-Shaped base structure deploying linear guideways at Hi-Low step arrangement, 3 axes adopts linear roller guideways.
- Auto Pallet Changer is driven by servo motor, APC speed can be adjusted according to pallet load.
- Auto Tool Changer is driven via cam mechanism and servo motor, ATC speed can be adjusted according to tool weight.
- High power spindle motor with ZF gearbox, delivery high torque during low speed, suitable for heavy duty cutting.



PRECISION RIGID SPINDLE



- Air jet around spindle nose.
- High rigidity large span layout.
- Special treatment for critical parts.
- High accuracy tool draw mechanism.
- Double anti-leak design.
- High precision labyrinth-type locknut.
- High rigidity quill.
- Optimal span from spindle nose to front bearing.

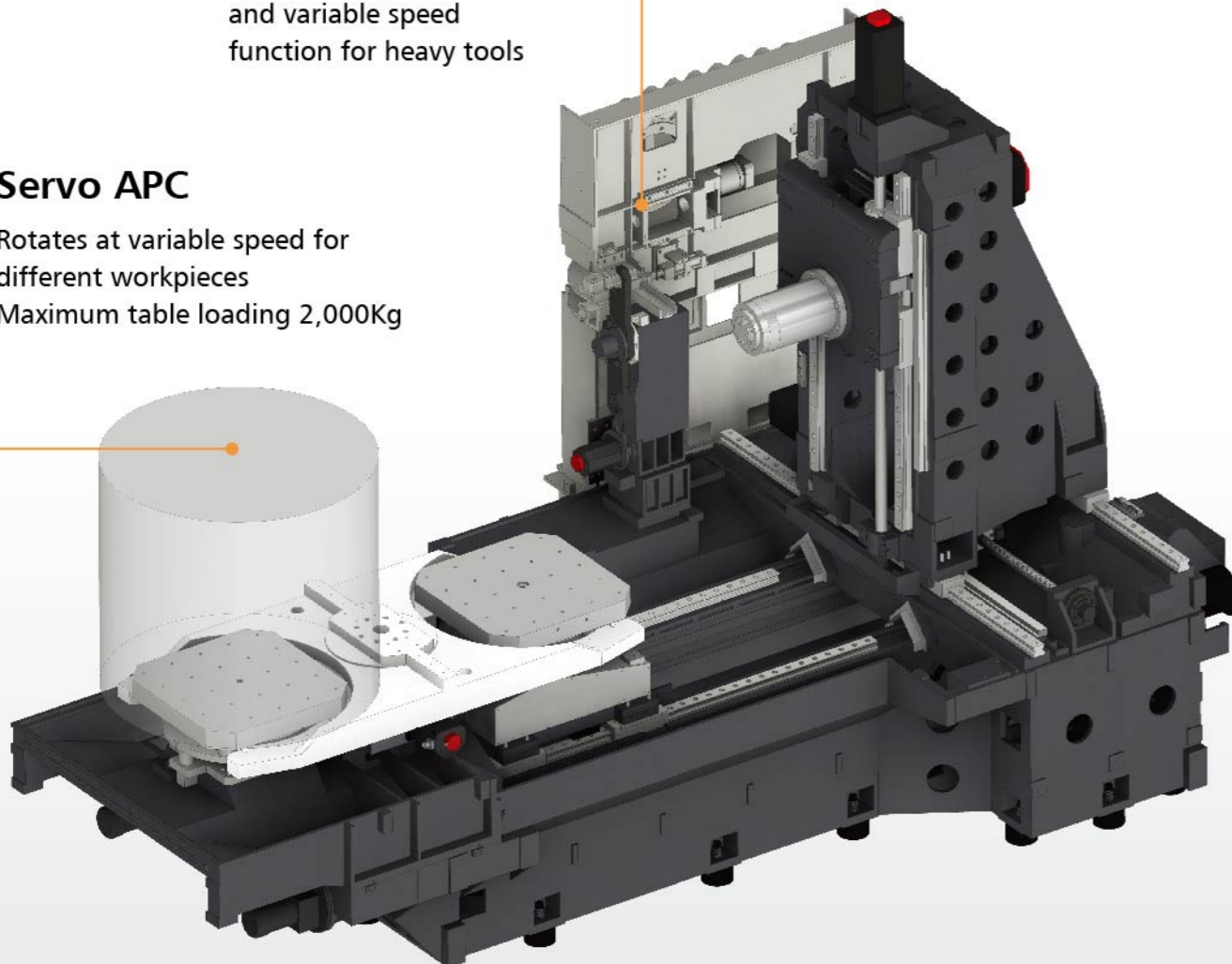


Servo ATC

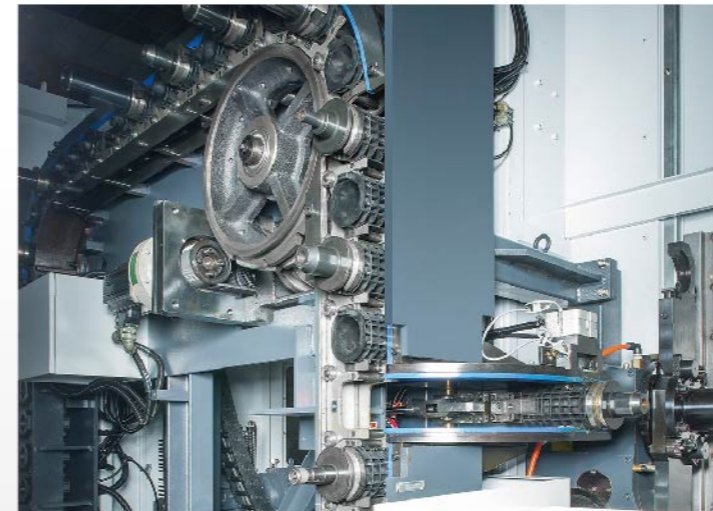
High-speed tool change and variable speed function for heavy tools

Servo APC

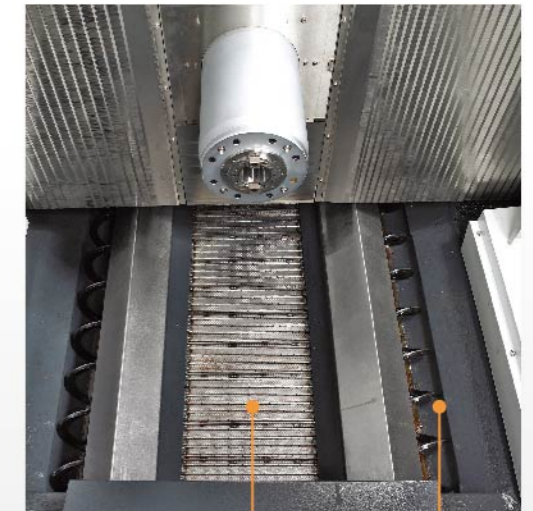
Rotates at variable speed for different workpieces
Maximum table loading 2,000Kg



60 Tools of ATC features



Unique C-shaped chain type architecture and minimalist design of a sprocket drive that facilitates tool pocket to quickly swing 90 degrees to reach ahead of tool change preparation.



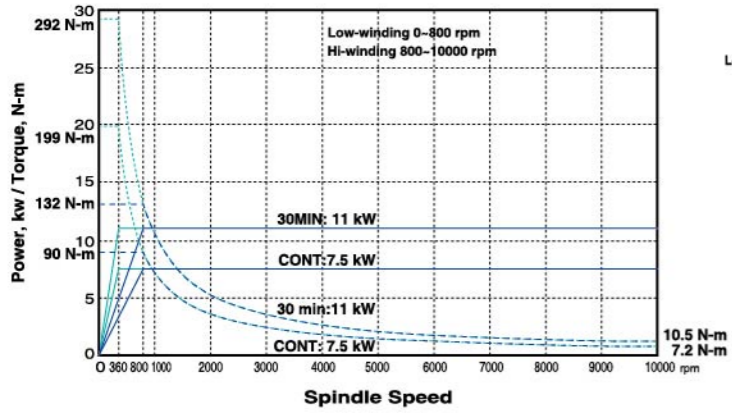
Chip Conveyor
Quickly removing metal chips that generating heat

Twin Screw Type

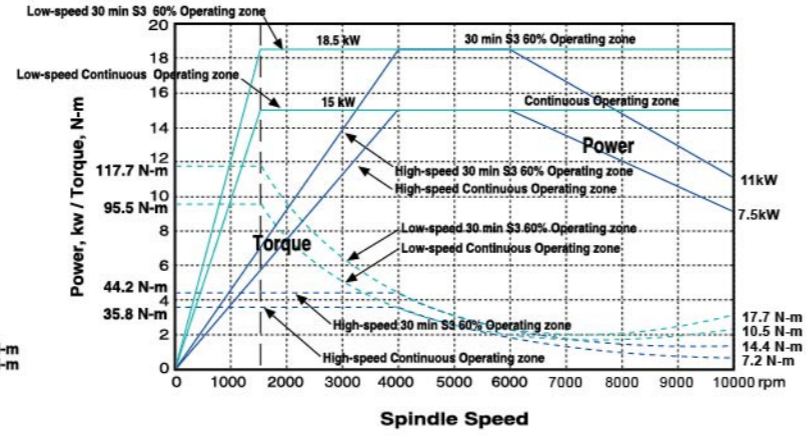
SPINDLE SPEED/OUTPUT DIAGRAM

— Low speed winding torque
— High speed winding torque

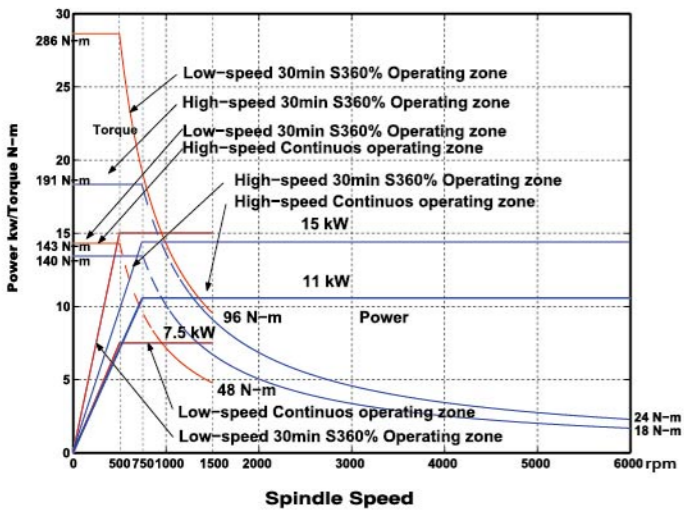
Power / Torque characteristics of FANUC α β 160L/Built-in Type (STD for FMH-400 / 500 #40)



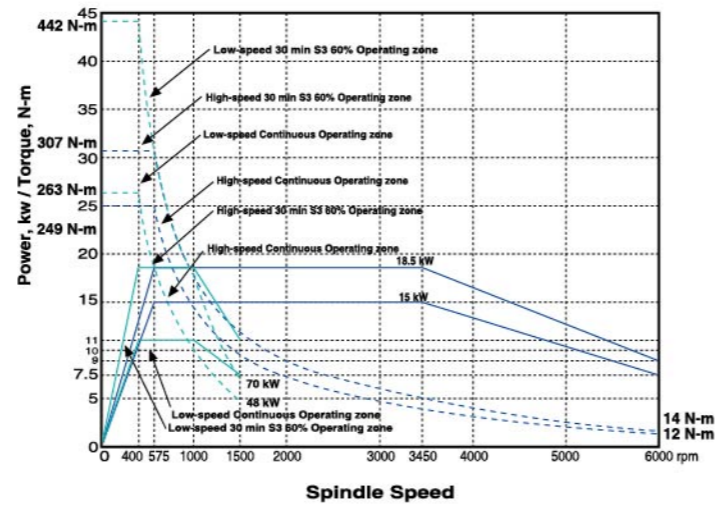
Power / Torque characteristic of FANUC α T15 / 10000i Spindle 10000 rpm (DDS for FMH-400 / 500)



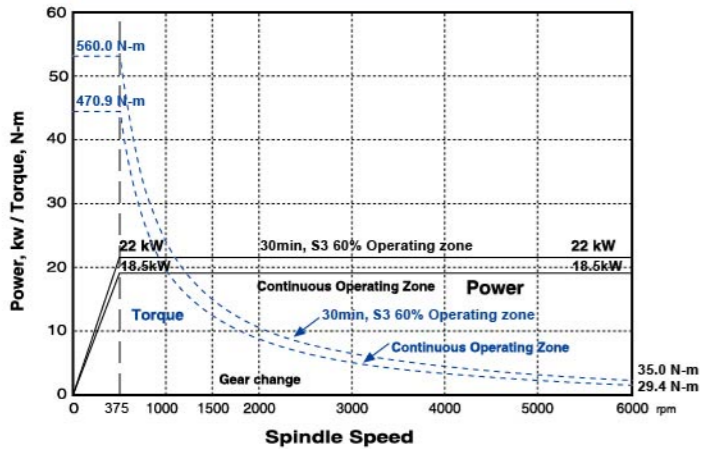
Power / Torque characteristic of FANUC α P22i/6000i Spindle 6000rpm (BELT TYPE for FMH-500#50)



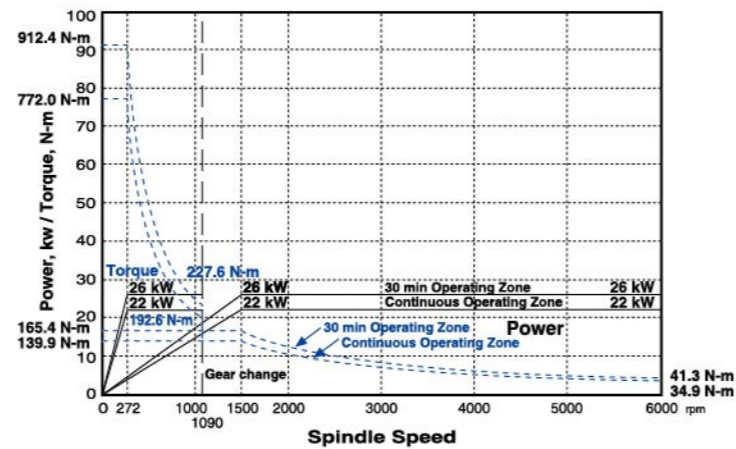
Power / Torque characteristic of FANUC α P30 / 6000i Spindle 6000 rpm (BELT TYPE, STD for FMH-630)



Power/Torque characteristic of FANUC α 18/7000i for ZF 2K250 GearBox and spindle 6000rpm (BELT TYPE, STD for FMH-630)

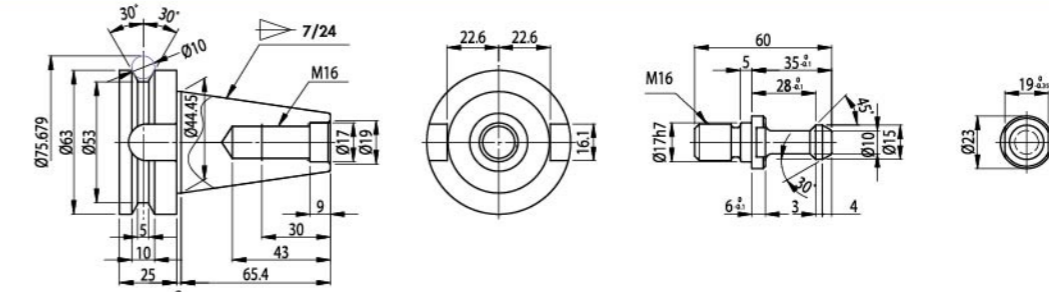


Power / Torque characteristics of 6k spindle with α 22 / 7000i FANUC motor and ZF gear box (1:5.5) (STD for FMH-800)

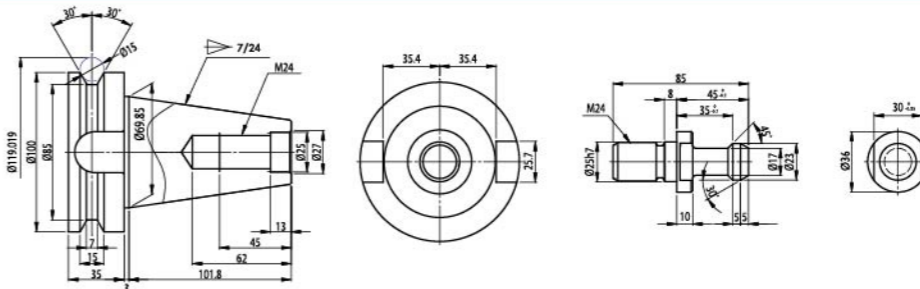


Tool Shank Specifications

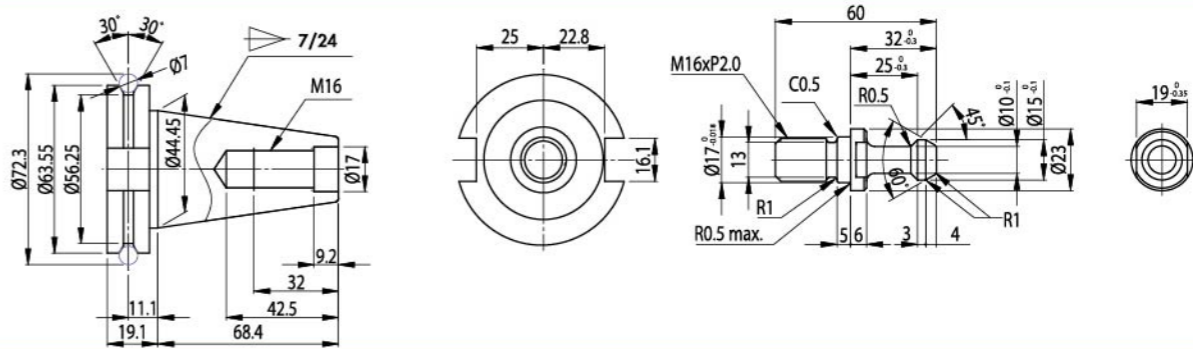
BT-40



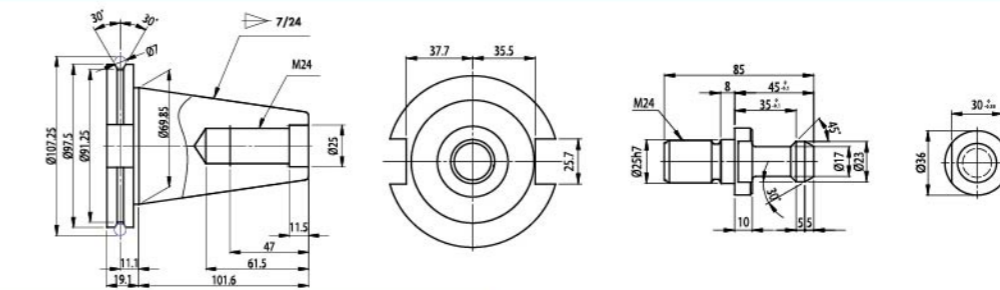
BT-50



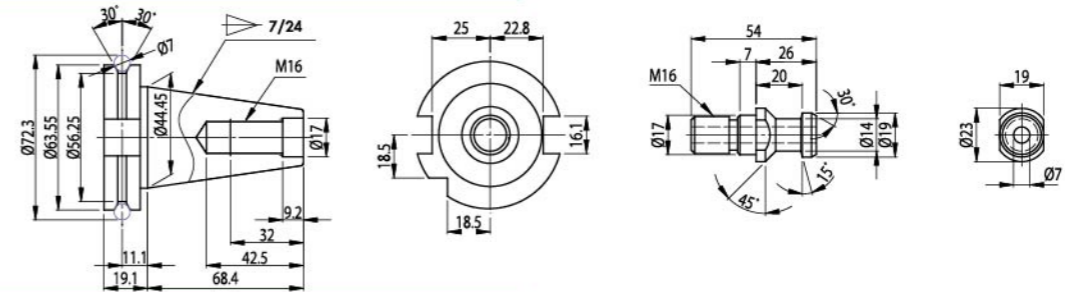
CAT-40



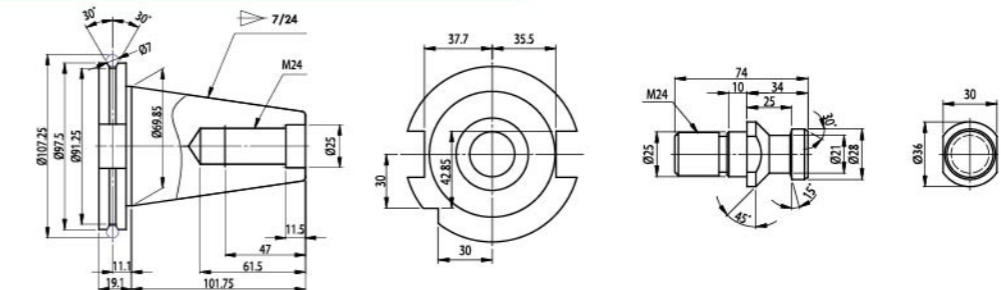
CAT-50



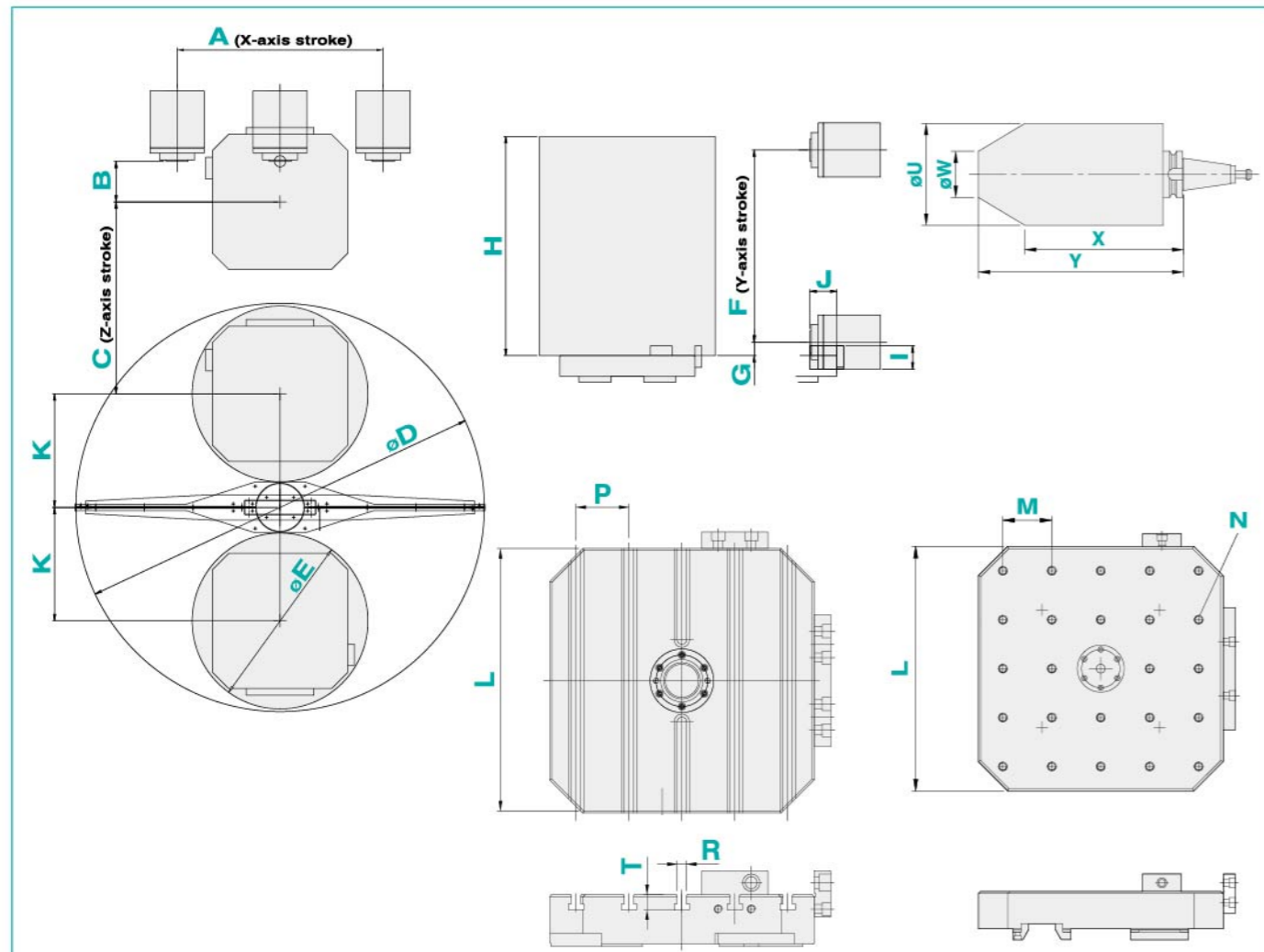
DIN-40 DIN69871+DIN69872 PULL STUD



DIN-50 DIN69871+DIN69872 PULL STUD



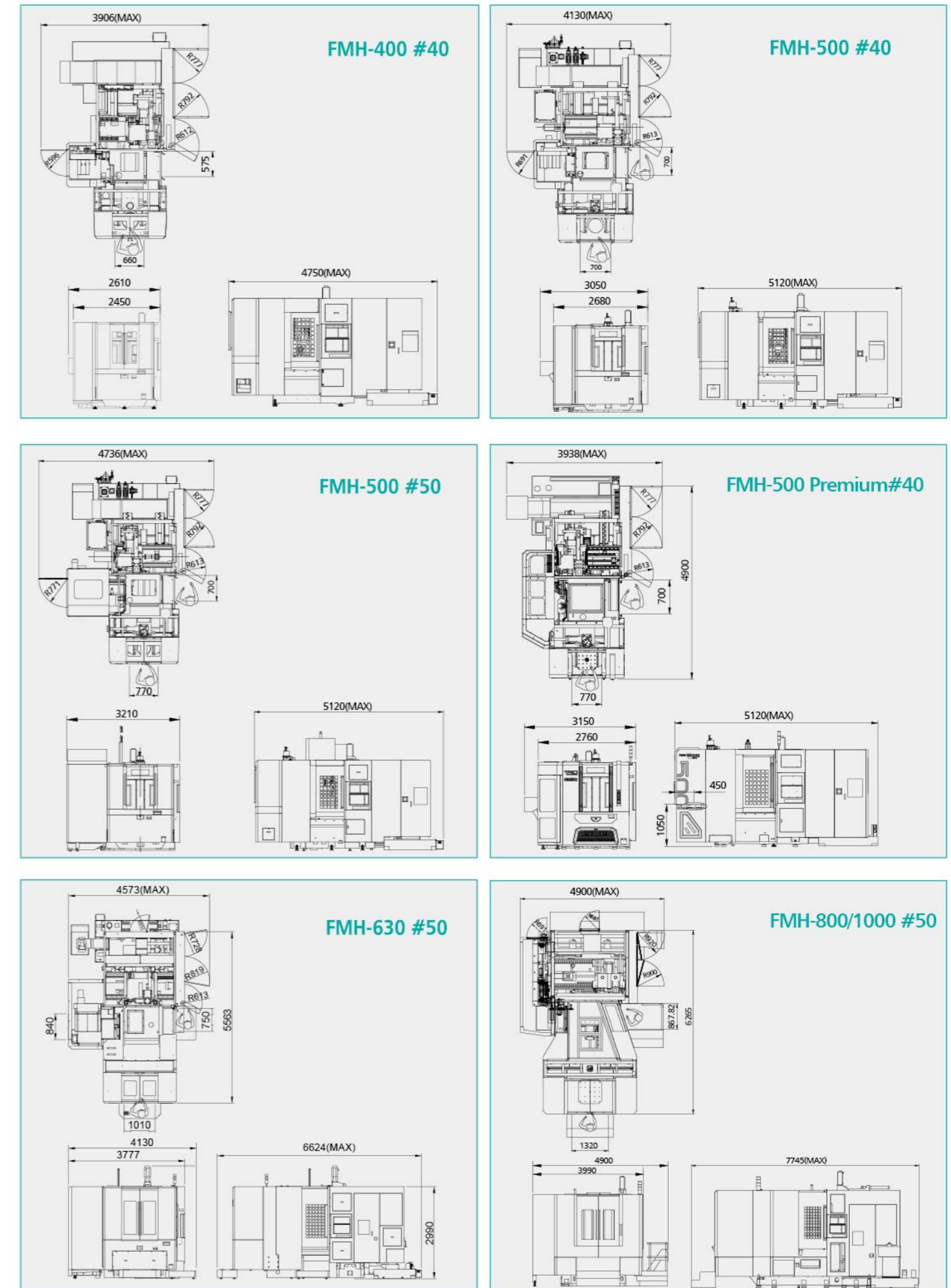
THREE AXES TRAVEL RANGE



Unit: mm

	FMH-400#40	FMH-500#40	FMH-500#50	FMH-500#40 Premium	FMH-630#50	FMH-800#50	FMH-1000#50
A	610	762	730	762	1000	1300	1300
B	130	150	100	100	200	150	150
C	560	710	710	800	850	1100	1100
D	1285	1510	1510	1550	2070	2900	2900
E	600	650	650	700	950	1300	1300
F	560	710	710	710	850	1020	1020
G	50	50	50	50	50	100	60
H	660	810	810	1000	950	1200	1200
I	86	86	110	86	113	80	120
J	95	100	50	100	115	285	385
K	335	420	420	420	560	800	800
L	400X400	500X500	500X500	500X500	630X630	800X800	1000X1000
M	80	100	100	100	125	160	125
N	24-M16X2.0P	24-M16X2.0P	24-M16X2.0P	24-M16X2.0P	24-M16X2.0P	24-M16X2.0P	80-M20x2.5P
P	80	100	100	100	125	160	125
R	14	14	14	14	18	22	22
T	23	23	23	23	30	42	42
U	140	140	220	190	220	250	250
W	-	-	100	-	125	-	-
X	-	-	400	-	480	-	-
Y	300	300	500	550	500	500	500

MACHINE DIMENSIONS



MACHINE SPECIFICATIONS

TRAVEL	MODEL	UNIT	FMH-400	FMH-500		FMH-500 Premium	FMH-630	FMH-800	FMH-1000	
			No.40	No.40	No.50(DDS)	No.50(BELT)	No.40	No.50	No.50	No.50
X Axis Travel		mm	610	762	730	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	100~810	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										
Table Dimension		mm	400 X 400	500 X 500			630 X 630	800 X 800	1000 X 1000	
Max.loading Weight		kg	400	1°:500KG/0.001°:600kg			1,200	2,000	2,000	
Screw Specifications		-	M16 X P2	M16 X P2			M16 X P2	M16 X P2	M20 X P2.5	
Min. Indexing Degree		degree	1°(opt:0.001°)	1°(opt:0.001°)			1°(opt:0.001°)	1°(opt:0.001/5°)	1°(opt:0.001)	
SPINDLE										
Spindle Speed		rpm	8,000/ 10,000(opt)	8,000/ 10,000(opt)	6,000/ 8,000(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 Nose Taper		-	7/24 Taper No.40	7/24 Taper No.40	7/24 Taper No.50	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
Dia. of Spindle		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	(BELT) 7.5/15	(DDS)15/18.5 (Built in)18.5/22(opt)	(BELT) 11/18.5	(BELT) 22/26	(BELT) 22/26
FEEDRATE										
X Axis Rapid Traverse		m/min	30(60)	30(48)	30(48)	30(48)	48(60)	24(42/48)	42	42
Y Axis Rapid Traverse		m/min	30(60)	30(48)	30(48)	30(48)	48(60)	24(42/48)	42	42
Z Axis Rapid Traverse		m/min	30(60)	30(48)	30(48)	30(48)	48(60)	24(42/48)	42	42
Cutting Feedrate		m/min	20	20	20	20	20	15(20)	20	20
AUTOMATIC TOOL CHANGER										
No. of Tools		-	40:60/120(opt)	40:60/90(opt)			40:60/120(opt)	40:60/90(opt)	60:90/120(opt)	60:90/120(opt)
Pull Stud(degree)		-	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	400	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 Heavy Tool=4.7/60	3.5/60 Heavy Tool=4.7/60
Number of Pallets		-					2			
Method of Pallet Change		-	ROTARY	ROTARY			ROTARY	ROTARY	ROTARY	ROTARY
Pallet Change Time		sec/Hz	8/60	8/60			8/60	10/60	20/60	20 (60HZ)
Floor Space		mm	2,610X4,750	3,050X5,120	3,210X5,120	3,210X5,120	3,150X5,120	4,130X6,624	4,900X7,745	4,900X7,745
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					65	70	70
Air Source		bar					6~8(85psi)			

STANDARD ACCESSORIES

- Built-in type 8,000 rpm spindle #40
- Belt type 6,000 rpm spindle #50 (FMH500,630)
- Belt type 6,000 rpm spindle #50 with gear box (FMH800)
- Rotary type automatic pallet changer
- Chip conveyor with bucket
- 1° indexing table
- 3-color signal light
- Spindle oil cooler
- Heat exchanger
- Working lamp
- Top flushing
- 2 sided chip screws
- Coolant gun

OPTIONAL ACCESSORIES

- B-axis 0.001 degree rotary table
- Coolant through spindle with filter system 20/50 bar
- B-axis rotary table with linear scale
- 60, 80, 90, 120 tools chain type ATC (Hydraulic Motor)
- Direct drive spindle
- Air condition for electric cabinet
- Spindle speed 10,000 rpm / BT-40
- Spindle speed 12,000 rpm / BT-40
- Spindle speed 8,000 rpm / BT-50
- Auto tool length measurement and breakage detection
- Touch probe workpiece measurement
- Auto power off
- T-slot pallet
- 3 axes linear scales
- Transformer
- CE modification
- 3 Axes Hollow ballscrew coolant
- Hydraulic interface for fixture
- Oil skimmer
- Single Pallet
- Mist collector

- Specifications are subject to change without prior notice.
- Heavy Tool definition = Over 15kg Tool.