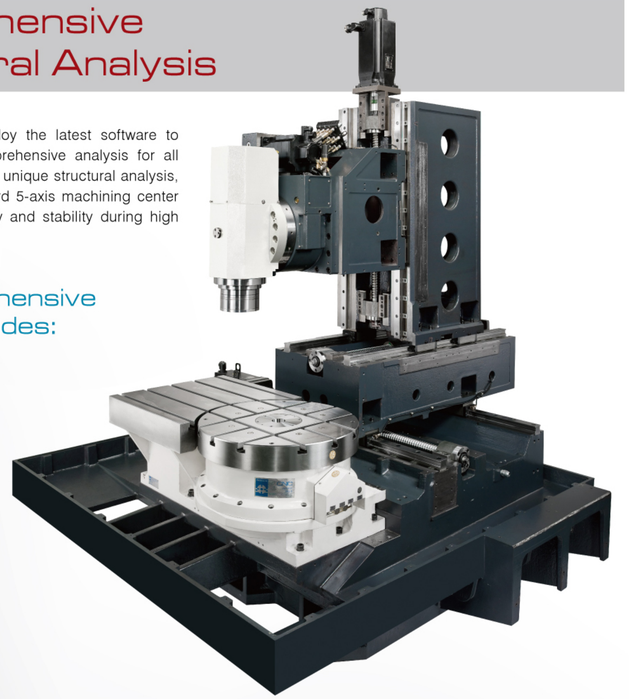
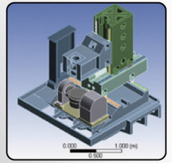
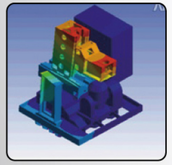
Comprehensive Structural Analysis

Hartford engineers employ the latest software to conduct the most comprehensive analysis for all structural parts. With this unique structural analysis, we can guarantee Harford 5-axis machining center exhibits ultra-high rigidity and stability during high speed cutting.



The comprehensive analysis includes:





MQT (Machine Quality Target)

Through virtual model analysis to acquire each machine's quality target.

- FEA (Finite Element Analysis)
  Finite Element Analysis enables a company to verify a proposed design will be able to perform to the client's specifications prior to manufacturing or construction.
- EMA (Experiment Modal Analysis)
  A structure measurement based on time essence to analyze the body structure (curve fitting), to obtaining core dynamic parameters (natural frequency, damping ratio, modal structure) design.
- MAC (Modal Assurance Criterion)
  Uses FEA virtual analysis data and experiment model analysis data to proceed with the MAC orthogonality and by using this FEA data it could be use it as a basic machine.
- KGM (Kreuz Gitter Me β System)
  Uses non-direct contact optical scale to precisely measure the inaccuracy and through using the NC parameter to calculate the optimum parameter in order to increase production accuracy.
- CSA (Cutting Spectrum Analysis)
  - Through cutting spectrum analysis and experiment.
  - Modal Analysis to proceed cross check to restrain milling.

Specifications

MODEL			UNIT	5VM-60RT	5VM-60MT
Table	Working surface		MM	Ø350	1040*600 / Ø600
	T-slot (size * number * pitch)		MM	12*8*45°	18*5*125
	Max. table load		Kg	H:150 / V:100	7000 / 4000
Travel	Longitudinal travel (X-axis)		MM	700	700
	Cross travel (Y-axis)		MM	600	600
	Vertical travel (Z-axis)		MM	500	500
			degree	A-axis -115°~20°	B-axis ±110°
			degree	B-axis 360°	C-axis 360°
	Distance from spindle end to table		MM	90~590	100~600
	Distance from spindle center to column		MM	761	761
Spindle	Spindle nose taper			#40	KM63
	Spindle speed		R.P.M.	15000(DDS)	12000
Feed	Cutting feed rate		MM / MIN.	1~12000	1~12000
		X.Y.Z axis	MM / MIN.	32000	32000
	Rapid traverse	A axis	RPM.	25	16.7
		C axis	RPM.	50	120
ATC (Automatic tool changer)	Tool storage capacity	A Tpye	PCs	24	24
	Max. tool weight	A Tpye	Kg	6	6
	Max. tool size (dia. * length)		MM	80*250	80*250
	Tool selection			Random	Random
	Tool shank			BT40/CAT40/DIN69871	KM63
	Tool stud bolt			MAS-P40T-1/CAT40/DIN69872	-
Motor	Spindle drive motor (30 min rating)		KW(HP)	12.5(16.7)	29.3
	X,Y,Z-axis drive motor		KW(HP)	X=8.6	X=8.6
				Y=4.5	Y=4.5
				Z=8.6	Z=8.6
				A=3.31	B=1.85
				C=2.4	C=3.96
Other	Required air pressure		Kg/cm^2	6.5	6.5
	Electric power consumption		KVA	50	50
	Machine weight		Kg	8000	8000
		Standard	MM	3690*3200	3690*3200
	Floor space (full guarding)	Link type chip conveyor	MM	4400*3200	4400*3200

• Design and specifications are subject to change without prior notice.

Hartford
The machining center company

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CAT. NO. 5VM-1001209'E01

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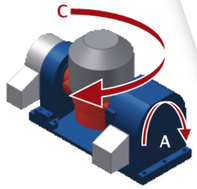
5-axis Vertical Moving Column Machining Center

5VM-60RT
5VM-60MT

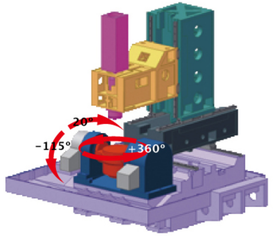
5VM-60RT

Excellent for high efficiency complex parts machining, the 5VM-60RT 5-axis machining center is equipped with a tilting rotary table (A, C-axis) that gives ultra-high efficiency machining.



Tilting Rotary table (A, C-axis)

- Table diameter Ø350mm
- A-axis tilting angle -115°~+20°
- C-axis rotating angle 360°
- A,C are driven by built-in high speed torque motors.
- A-axis speed: 25 rpm
- C-axis speed: 50 rpm
- Min. indexing accuracy 0.001°
- A-axis positioning accuracy: ±10sec. Repeatability: 4sec.
- C-axis positioning accuracy: ±5sec. Repeatability: 4sec.

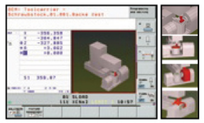


Precision Performance Plus Outstanding Features Throughout

- Traveling column construction features increased efficiency.
- Linear ways on X, Y, Z-axis.
- 15,000 rpm spindle speed on 5VM-60RT
- 12,000 rpm on 5VM-60MT.
- Rapid traverse on X, Y, Z-axis permits high speed feed with minimum stability.
- 24 Tools arm type ATC.
- Specially designed oil and fluid separated construction.
- Dynamic collision monitoring for safety.
- Comprehensive structural analysis guarantees extraordinary stability.
- Linear scales on 3 axes (optional).
- PID high-accuracy electronically controlled oil cooler provides constant oil temperature control.

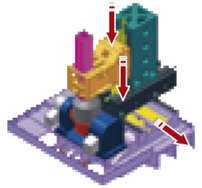
Dynamic Collision Monitoring (DCM)

The DCM function provides a safety protection for the operator and the machine. In addition, it also effectively reduces operational fatigue of the operator.



Oil and Fluid Separated Structure

The specially designed oil and fluid separation system effectively extends the service life of cutting fluid, lowers production cost and meets environmental protection requirements.

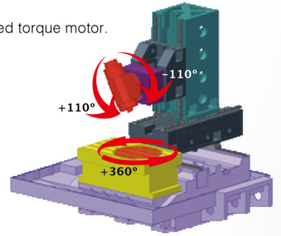


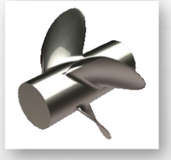
5VM-60MT

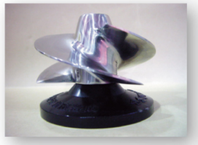
A high speed 5-axis machining center designed with swiveling spindle head (B-axis) combined with a rotary table (C-axis) make it well suited for complex parts machining.

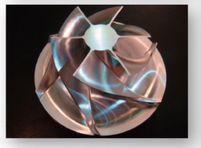
DDM Rotary Table (C-axis)

- Table diameter Ø600mm.
- C-axis is driven by built in high speed torque motor.
- Min. indexing accuracy 0.001°
- C-axis rotating angle 360°
- C-axis speed 120 rpm
- Positioning accuracy: ±5sec. Repeatability: ±3sec.









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