

**Hartford**  
The machining center company

# TITAN

Moving Column Type Double Column Machining Center

- High table loading 3000kg/m<sup>2</sup>.
- Up/down travel 3000 mm.
- Flexible angular head cutting.

## HARTFORD

Over 45 years, Hartford has sold over 30,000 machines globally, resulting in over 24,000 satisfied customers and a wealth of feedback that has added to our arsenal of experience and fine craftsmanship. In accordance with our insistence on providing only the highest quality of machining centers, every possible resource is utilized to constantly upgrade our technological levels in manufacturing and other applications.

# Hartford

The machining center company

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### EU TECHNICAL CENTER

Prague, Czech Republic

### DISTRIBUTION CENTER

Le Havre, France Istanbul, Turkey Bangkok, Thailand

Caxias Do Sul, Brazil Bs.As, Argentina

### SALES & SERVICE CENTER

Korea - Seoul, Busan, Daegu

China - Tianjin, Shanghai, Foshan, Huangyan, Shenyang

Taiwan - Taipei, Taoyuan, Hsinshu, Taichung, Tainan, Kaohsiung

CAT. NO. Titan-500910 E02



4,500 DMCs Worth of Expertise  
The Most Experienced Manufacturer in Taiwan



Hartford care inside



# **HUGE CAPACITY** with **FAST MOVEABLE COLUMN** for **YOUR LARGE WORKPIECE** **MACHINING REQUIREMENTS.**



Picture Shown is **VFCW-17550**  
Moving Column with W-axis Series



## BIG IN EVERY WAY PLUS QUALITY FEATURES THROUGHOUT

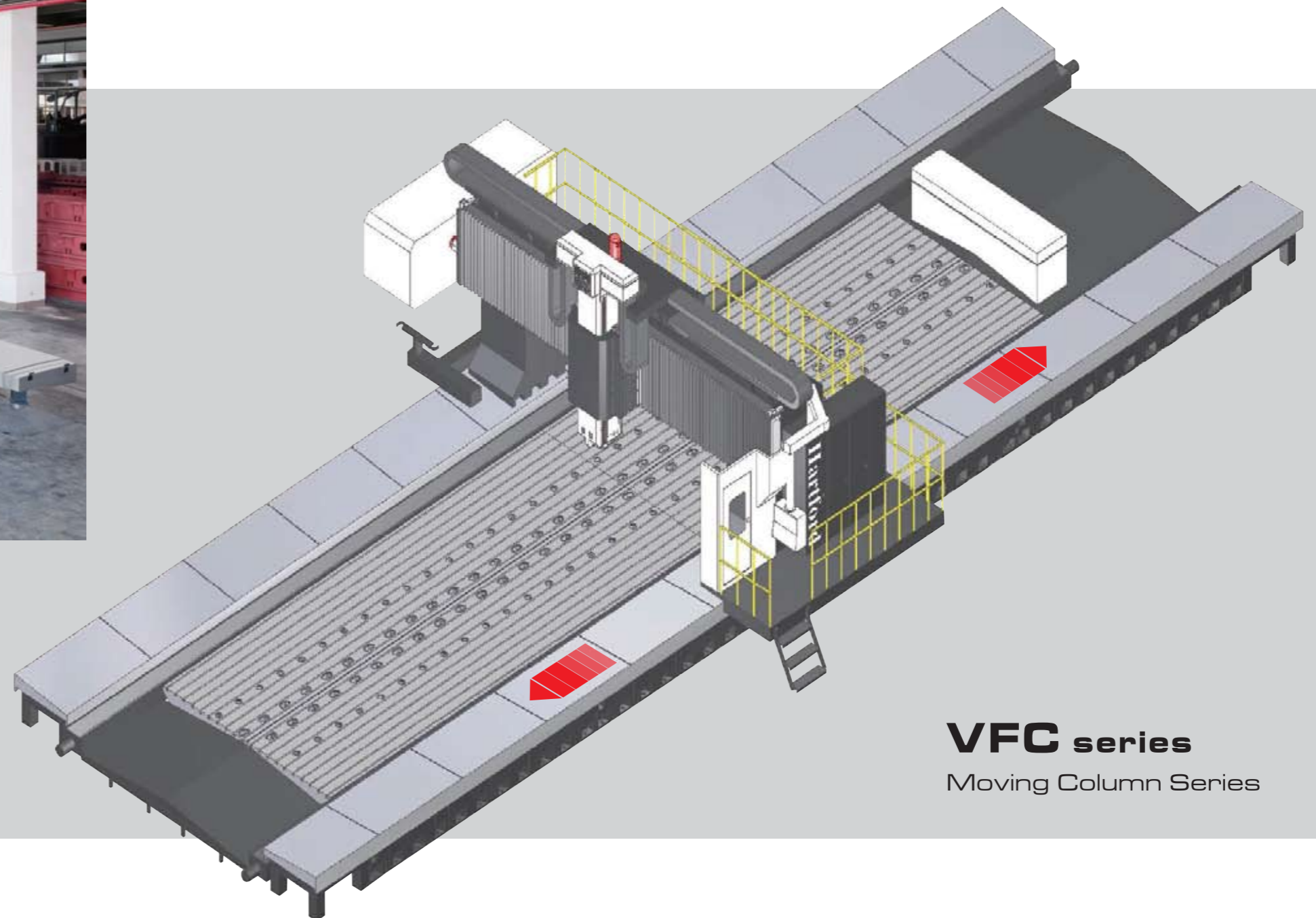
### FOUR AXES LINEAR WAYS

- X-AXIS: 4 ROLLER LINEAR GUIDE WAYS
- Y-AXIS: VERTICAL DEPLOYED, 2 ROLLER LINEAR GUIDE WAYS
- Z-AXIS: 4 ROLLER LINEAR GUIDE WAYS
- W-AXIS: 6 ROLLER LINEAR GUIDE WAYS



### **VFCW series**

Moving Column with W-axis Series



### **VFC series**

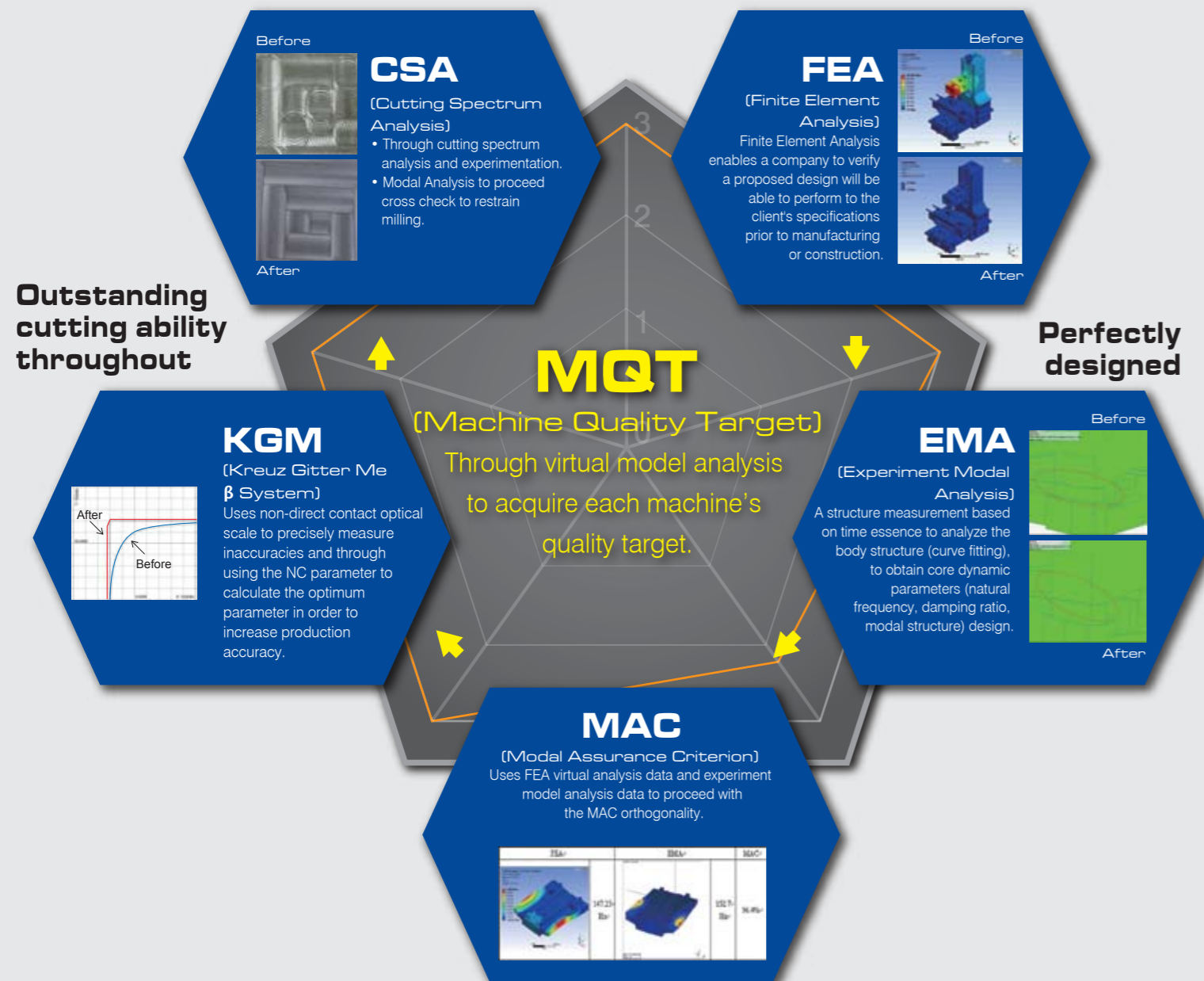
Moving Column Series



# Hartford Technology - Always a Step Ahead.

## Hartford Professional **Research** and Development **Process Management**

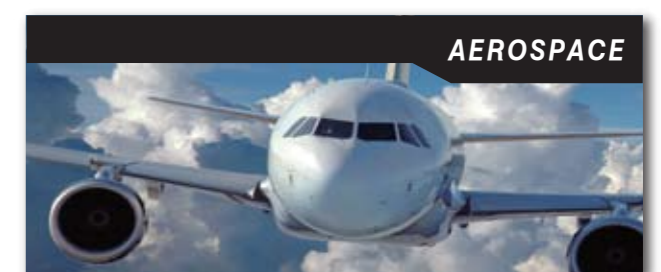
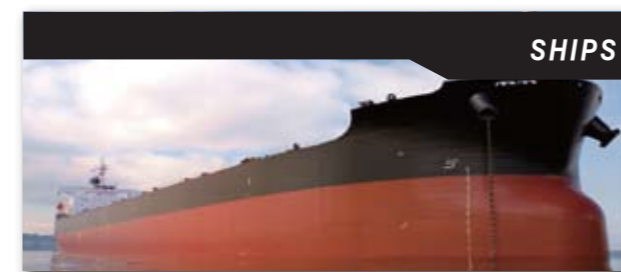
A Dependable Guarantee for R&D and  
Cutting Rigidity through **MQT**  
Hartford machines are designed through the comprehensive MQT process.



## Exclusive FEATURES

1. Wide range models for selection, the size can be as big as 20 M, which is the largest moving column and moving beam machine from Taiwan. (VFCW ONLY)
2. Fully equipped with European famous brand roller-type linear ways exhibit extra high accuracy and rigidity.
3. W-axis has braking function, providing increased stability in machining. (VFCW ONLY)
4. Z-axis is supported by 4 linear ways for greater stability during machining. (Patent no. I264343)
5. The linear ways fixing on Z-axis cast iron is an immersed structure that keeps linear ways in the protection range at all times during machining. This special feature also provides a thorough protection for the linear ways while reducing cutting interference area to a minimum.
6. Z-axis linear ways are bound in three sides to balance the stress of Ms, Mb and Mc, and allow the linear ways to develop maximum loading capacity in three directions. In addition, this can improve load concentration at Ma and Mb that usually occurs on two sides binding vertically mounted linear ways. (Patent no. I264343)
7. Specially designed with additional two-point support for Y-axis ball screw that influences accuracy. (Patent no. M336108)
8. Enlarged column structure combined with multiple blocks for supporting X-axis assures ultra-high rigidity.
9. Rack transmission on X-axis and the use of European famous brand backlash eliminats transmission mechanism ensure higher positioning accuracy. (VFCW ONLY - 9m & above)
10. Gear-drive spindle offers maximum speed up to 6000 rpm. Europe imported gearbox features high speed, high torque and high rigidity.
11. The magazine moves together with column. A choice of 40 or 62 tools will reduce time waste of tool change. (VFCW only)
12. Extra large distance between columns allows for machining 4500mm width of workpiece.
13. Extra large height of column provides 450-3450mm distance from the spindle end to the table surface. Upon request, 450-3750mm distance is available. (VFCW only)
14. Height of operation platform is adjustable as desired. (Patent pending. VFCW only)
15. Direct drive on Z-axis in combination with high response counter-balance for increasing accuracy of machining.
16. The entire machine is subject to comprehensive analysis by means of FEA/EMA/CSA/KGM/ESSA/EDSA to achieve an optimal design.
17. A comprehensive range of angular heads to choose from, including 90° head, 30° head, extension head and BC universal head. Also, the head features automatic loading and unloading and swiveling function.
18. The highest head rotating speed in Taiwan:  
(1) 90° head 4000 rpm (2) 30° head 5000 rpm  
(3) Extension head 6000 rpm (4) BC universal head 4000 rpm
19. Innovative automatic circulated lubrication in milling head effectively represses thermal displacement. (Patent pending)
20. The spindle of angular head features chip flushing function (allows to be changed with workpiece air blast device).
21. The spindle of angular is designed with automatic tool knocking activated by hydraulic cylinder.
22. Oversized table thickness provides an increase of loading capacity.
24. The magazine provides multi-positioning for tool change. (VFCW only)
25. Oil magazine provides multi-positioning for tool change.
26. Self table finishing on the machine ensures the best possible geometric accuracy.

## IDEAL USERS INCLUDE



# HARTROL HARTFORD EXCLUSIVE

## HARTFORD ENHANCED CNC CONTROLLER - VARIOUS FUNCTIONS DEVELOPED BY HARTFORD

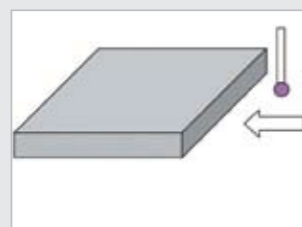


### SPECIAL CANNED CYCLES

HARTROL provides unique graphic dialog for program editing and creates programs automatically. This feature cannot be achieved on the competitive models. What they can provide is only a menu without creating programs automatically.

### CONVERSATION PROGRAM

- Hole patterns
- Face milling
- Side milling
- Pocketing
- Automatically creates machining programs.



### WORKPIECE CALIBRATION

Ten workpiece calibration methods to select from. The function not only creates the reference points of a workpiece but also calculates workpiece measurements such as lengths and widths of a square workpiece, and diameters of a circular workpiece. The outstanding calibration function will greatly shorten time for workpiece calibration.

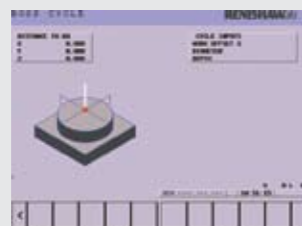


### TOOL REGISTER

- Magazine Management: The tool number variation can be identified on the display. Small and big diameters of cutter are also displayed for easy identification.
- Tool Shape: The tool displayed on the FANUC control does not display the machine coordinate, which is inconvenient when setting tool length. The additional machine coordinate display is designed for solving such a problem. In addition, operator can set tool shape and notes as desired without attaching memos to the machine.

Tool Magazine Management  
Big Circle: Large diameter tool  
Small Circle: Normal tool

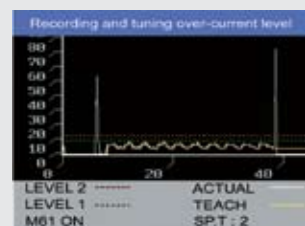
- ① Machine Coordinate
- ② Tool Shape



### AUTOMATIC WORKPIECE MEASUREMENT (OPTIONAL)

The workpiece sizes are important after machining. RENISHAW OMP60 is applied for measuring workpiece sizes with graphic comparison for added convenience.

HARTROL CONTROLLER combined with RENISHAW GUI  
Graphic interface supports RENISHAW OMP60 / RMP60 / OMP40



### SPINDLE LOAD MONITOR (OPTIONAL)

Tool wear is a serious problem, especially when performing heavy duty cutting. To fully eliminate this problem, the HARTROL control is designed with two-step spindle load monitoring for protecting tool and workpiece.

- First Step: A warning message appears to alert operator, but the machine still keeps working.
- Second Step: A serious warning appears. The machine operation stops to avoid bumping against cutter.

The new version AI300 A13 will provide a learning function.



### AUTOMATIC TOOL MEASUREMENT (OPTIONAL)

The tool sizes are important before performing machining. The RENISHAW TS27R is suggested for measuring tool length and diameter with graphic comparison for added convenience.

HARTROL CONTROLLER combined with RENISHAW GUI

Graphic interface supports RENISHAW TS27R

# HARTFORD'S CUTTING-EDGE CONTROL TECHNOLOGY

## for INCREASED CNC PERFORMANCE

### LEADING ELECTRICAL RESEARCH & DEVELOPMENT



### HPF - High Performance Five-face

Five-face production accuracy compensation function

- The same program can be exercised at 5 five faces.
- The mechanical tolerance and accumulative error can be compensated.



### ALD - Advanced Load Detection

Spindle load monitoring

- It protects spindle and workpiece with two-level detection method.
- Detection level is adaptive with different tools.



### SRC - Smart Rotation Command

3 dimensional production commands M206

- Three dimension coordinate rotation can be carried out with the most simple commands.
- This function is very useful for any kind of angular head.



### STC - Spindle Thermo Compensation

Heat extension compensation

- Thermo displacement is suppressed with preset spindle sensors.
- The satisfies the requirement of long-time, high accuracy machining.



### ACD - Advanced Collision Detection

Interference (anti-collision) control function

Machine collision can be avoided with interference check function before machining.

### Auto-Head Change



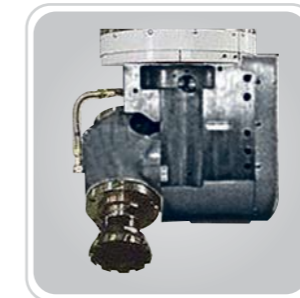
90 Degree Head by Auto Positioning



Straight Extension Head

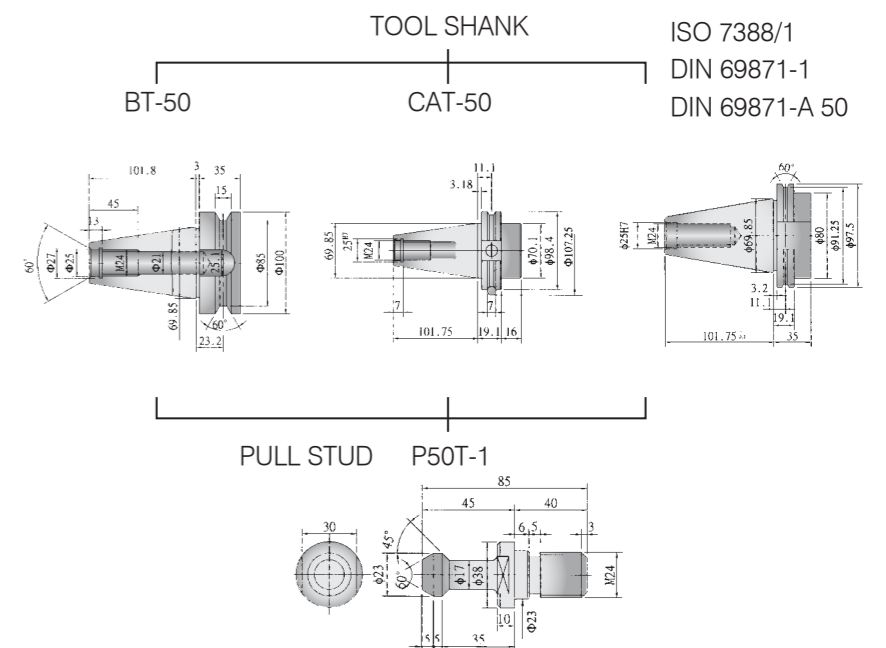


30 Degree Head by Auto Positioning



BC Universal Head Auto Positioning

### TOOL DIMENSIONS





# MACHINE SPECIFICATIONS

## VFCW series

Moving Column with W axis Series

VFCW																
MODEL	UNIT	6550	7550	8550	9550	10550	11550	12550	13550	14550	15550	16550	17550	18550	19550	20550
Working surface	mm	6000 x 4000	7000 x 4000	8000 x 4000	9000 x 4000	10000 x 4000	11000 x 4000	12000 x 4000	13000 x 4000	14000 x 4000	15000 x 4000	16000 x 4000	17000 x 4000	18000 x 4000	19000 x 4000	20000 x 4000
T-slot(Size×Number×Pitch)	mm	28×20×200														
Max. table load	Kg/m <sup>2</sup>	3000														
Longitudinal travel (X-axis)	mm	6200	7200	8200	9200	10200	11200	12200	13200	14200	15200	16200	17200	18200	19200	20200
Cross travel (Y-axis)	mm	5500														
Vertical travel (Z-axis)	mm	1200/1500(opt.)														
Vertical travel (W-axis)	mm	1800														
Distance from spindle end to table	mm	450~3450 / 450~3750														
Width between column	mm	4500														
Spindle speed (Gear type)	rpm	6000														
Spindle nose tape		ISO50														
Cutting feed rate (X、Y、Z axis)	mm/min	5000														
Rapid traverse (X、Y、Z、W)	mm/min	VFCW-6550/7550/8550、X=10000 VFCW-9550/10550/11550/12550/13550/14550/15550、X=8000 VFCW-16550/17550/18550/19550/20550、X=6000 Y=8000 Z=12000 W=3000														
ATC																
Tool storage capacity	PCS	40/62(opt.)														
Max. tool weight	Kg	25														
Max. tool size (diameter×length)	mm	Ø200×400														
Tool shank		BT50/CAT50														
Pull stud bolt		P50T-1														
MOTOR																
Spindle drive motor (Fanuc)	Kw/HP	26/35 (30/50-opt.)														
Required air pressure	Kg/cm <sup>2</sup>	6.5														
Electric power consumption	KVA	135														
Machine weight (N.W.)	Kg	122 ℓ	129 ℓ	136 ℓ	143 ℓ	150 ℓ	157 ℓ	165 ℓ	172 ℓ	179 ℓ	186 ℓ	193 ℓ	200 ℓ	207 ℓ	214 ℓ	221 ℓ
		17200	18200	19200	20200	21200	22200	23200	24200	25200	26200	27200	28200	29200	30200	31200
Floor space (Full Guarding)	mm	x 11500	x 11500	x 11500	x 11500	x 11500	x 11500	x 11500	x 11500	x 11500	x 11500	x 11500	x 11500	x 11500	x 11500	x 11500

### STANDARD ACCESSORIES

- Cooling system
- Centralized automatic lubrication system
- Air blast through spindle
- Spindle oil cooler
- Screw type chip conveyer
- Link type chip conveyor
- Fluorescent
- Semi-splash guard
- Automatic power off
- Operation finish lamp
- Foot switch for spindle clamp /unclamp
- Remote manual pulse generator
- Convection heat exchanger in control box
- 6000 rpm gear head
- Oil fluid separator
- Tool storage capacity
- Workpiece calibration (manually)
- Spindle load monitor
- Rs-232 interface
- Leveling bolts and blocks
- Adjusting bolt and blocks
- Adjusting tools and box
- Operation manual & electric drawing equipment
- High speed high accuracy parameter screen
- Tool magazine display
- M code display
- PLC bit setting screen
- Tool comment
- Hole pattern
- Face milling cycle
- Side milling cycle
- Pocketing cycle
- True circle cutting

### OPTIONAL ACCESSORIES

- Portable chip bucket (for link type chip conveyor)
- Oil skimmer
- Coolant through spindle (only vertical spindle)
- NC rotary table
- 30° head by auto positioning
- 90° head by auto positioning
- BC universal head auto positioning
- Straight extension head
- Auto tool length measurement
- Imitative mold cutting system
- Closed loop linear scale positioning system
- Coolant gun
- Air gun
- Large diameter tool
- 3D coordinate display
- Program scheduling
- Machining time stamp
- Five face machine data setting

## VFC series

Moving Column Series

VFC								
MODEL	UNIT	5450	6450	7450	8450	9450	10450	
Working surface	mm	5000 x 4000	6000 x 4000	7000 x 4000	8000 x 4000	9000 x 4000	10000 x 4000	
T-slot(Size×Number×Pitch)	mm	28×20×200						
Max. table load	Kg/m <sup>2</sup>	3000						
Longitudinal travel (X-axis)	mm	5200	6200	7200	8200	9200	10200	
Cross travel (Y-axis)	mm	4500/5500(AHC opt.)						
Vertical travel (Z-axis)	mm	1200/1500(opt.)						
Distance from spindle end to table	mm	450~1650 / 450~1950(opt.)						
Width between column	mm	4500						
Spindle speed (Gear type)	rpm	6000						
Spindle nose tape		ISO50						
Cutting feed rate (X、Y、Z axis)	mm/min	5000						
Rapid traverse (X、Y、Z)	mm/min	X=10000 Y=10000 Z=12000			X=8000 Y=10000 Z=12000			
ATC								
Tool storage capacity	PCS	32 / (40/62-opt.)						
Max. tool weight	Kg	20						
Max. tool size (diameter×length)	mm	Ø125×400 / Ø250×400						
Tool shank		BT50/CAT50						
Pull stud bolt		P50T-1						
MOTOR								
Spindle drive motor (Fanuc)	Kw/HP	26/35 (30/50-opt.)						
Required air pressure	Kg/cm <sup>2</sup>	6.5						
Electric power consumption	KVA	125						
Machine weight (N.W.)	Kg	85 ℓ	92 ℓ	99 ℓ	106 ℓ	113 ℓ	120 ℓ	
		15200	16200	17200	18200	19200	20200	
Floor space (Full Guarding)	mm	x 11500	x 11500	x 11500	x 11500	x 11500	x 11500	

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