



Richmond

*Vertical
Machining Centres
High Speed, Heavy Duty
Precision Cutting*



The design and specification of Richmond VMC's has been developed by 600 Group as ideal partner products for Colchester and Harrison Lathes.

Richmond VMC's are available in the USA sold under the Storm brand.
www.clausing-industrial.com



RICHMOND

Whatever the requirement there
is a Richmond VMC for Every Application

Our new generation of Richmond Vertical Machining Centres have been designed with more standard and optional features than ever before. With a greatly expanded range of models and competitive pricing you are certain to find a machine ideally suited to your needs.

- Heavy cast iron base, saddle and table minimise vibration during heavy cutting.
- 40mm pre-tensioned ballscrews, directly coupled to the servo drive motor provides stronger, more precise and more durable operation.
- Duplex angular contact bearings support both ends of all ballscrews, which are far superior to lower cost single radial bearings.
- High performance spindle fitted with 2+2 matched super precision bearings for greater long term precision and reliability.

Richmond VMC's offer real CNC machining power, precision and performance. Available in a full range of models, there is a machine to meet most requirements

VMC500L

- Linear Ways
- BT 30/40
- 12, 16 or 20 tools
- 600 x 300mm Table
- Travels L 510x410x460
- Travels S 510x410x460
- 5.5 or 7.5 kw Spindle Motor
- 8/10/12,000 rpm Spindle

VMC850L/S

- Linear or Solid Ways
- BT 40
- 16, 20 or 24 tools
- 1000 x 500mm Table
- Travels L 850x510x560
- Travels S 850x510x560
- 11 or 15 kw Spindle Motor
- 8/10/12,000 rpm Spindle

VMC1300S

- Solid Ways
- BT 40/50
- 20, 24 or 32 tools
- 1400 x 600mm Table
- Travels L 1300x650x710
- Travels S 1300x650x710
- 11 or 15 kw Spindle Motor
- 8/10/12,000 rpm Spindle
5,000rpm - BT 50

VMC610L/S

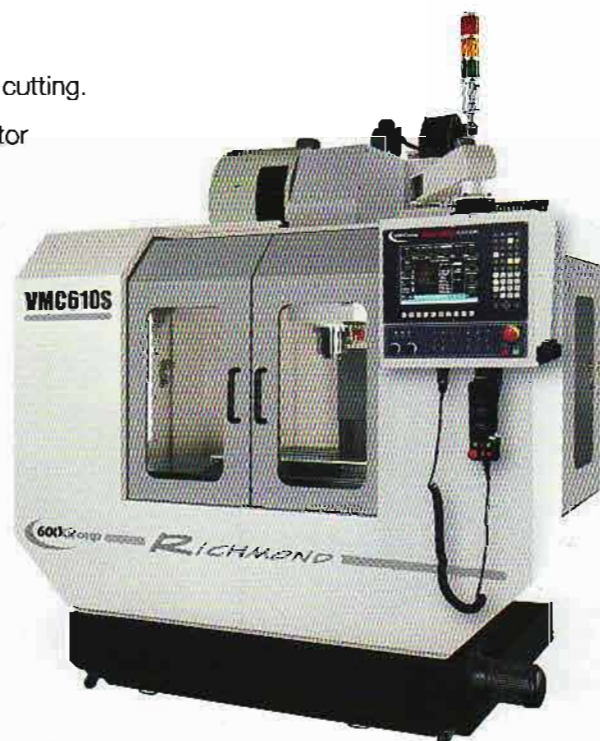
- Linear or Solid Ways
- BT 40
- 16, 20 or 24 tools
- 800 x 450mm Table
- Travels L 610x460x510
- Travels S 610x460x510
- 11 or 15 kw Spindle Motor
- 8/10/12,000 rpm Spindle

VMC1020L/S

- Linear or Solid Ways
- BT 40
- 16, 20, 24 or 32 tools
- 1120 x 500mm Table
- Travels L 1020x510x560
- Travels S 1020x510x560
- 11 or 15 kw Spindle Motor
- 8/10/12,000 rpm Spindle

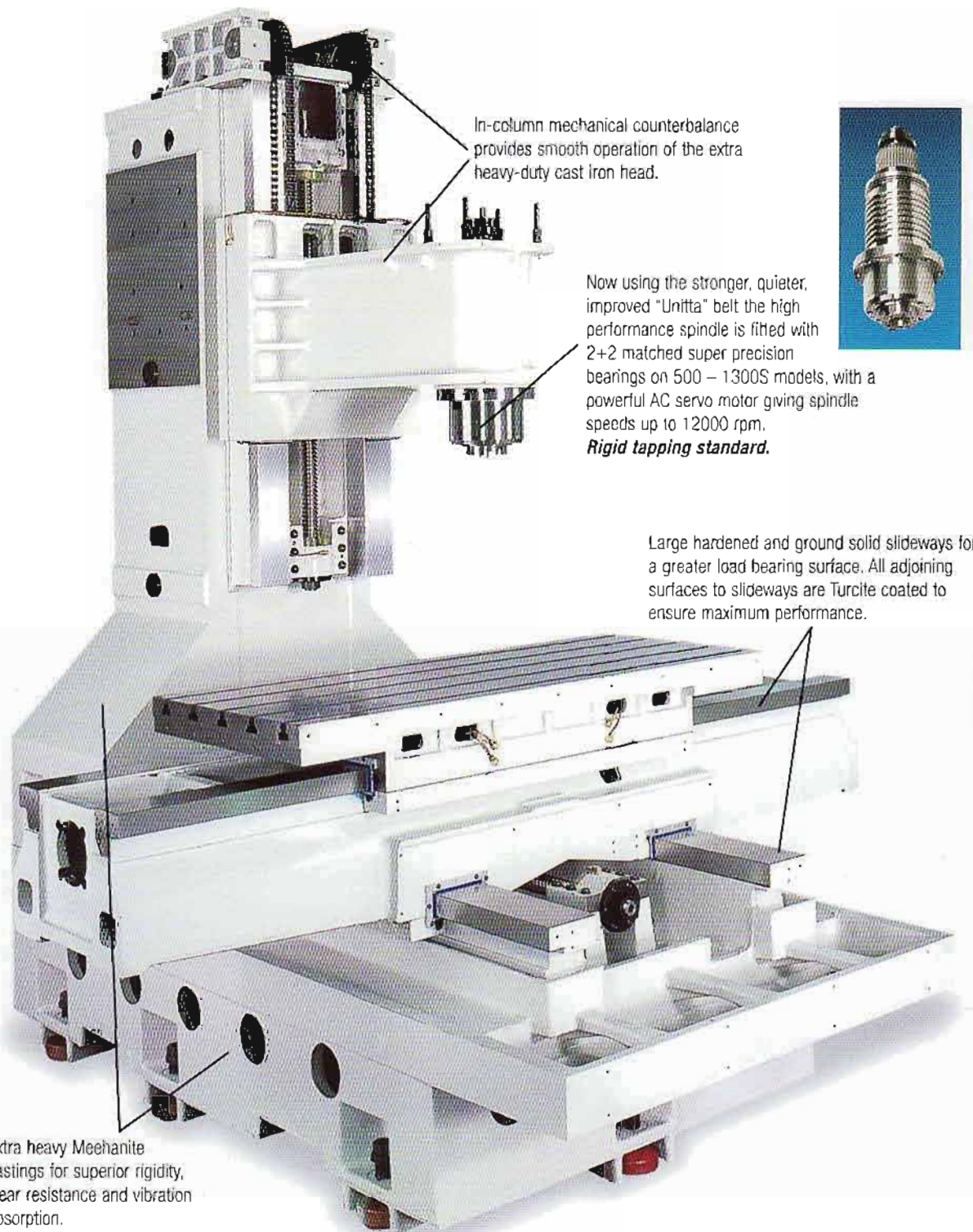
VMC1600S

- Solid Ways
- BT 50
- 24 or 32 tools
- 1700 x 815mm Table
- Travels L 1600x800x700
- Travels S 1600x800x700
- 15 or 22 kw Spindle Motor
- 4/6,000 rpm Geared head
10,000rpm Belt head



Solid Ways on S Models

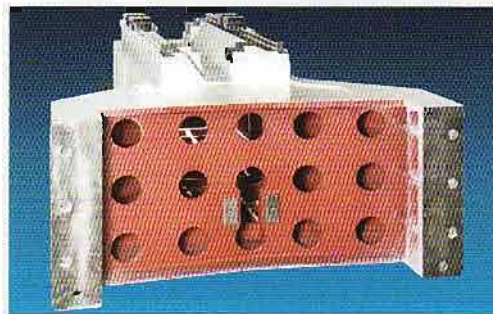
For applications demanding heavy duty precision cutting, there is no substitute for solid slideways. The latest Richmond range offers hardened and ground ways on all models from VMC 610 to VMC 1600



Heavy-Duty Precision Cutting

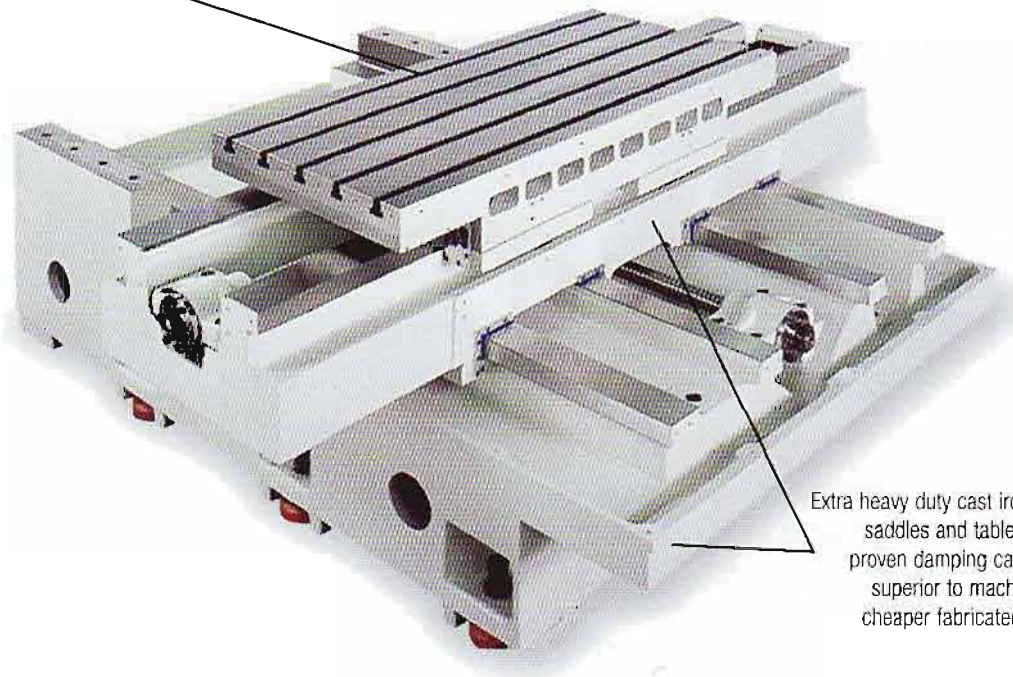


A "state-of-the-art ball bar test" confirms squareness and accuracy of micro movement. The test is computer recorded during a simulated run in all operational directions between the spindle and table.



The massive cast iron column construction, provides greater damping capacity than steel. Our extra deep column is heavily ribbed for maximum lateral stiffness, designed to maintain consistent accuracy and thermal stability while withstanding the tremendous forces required during heavy cutting.

A special high precision machining and finish process provides accurate T-slot positioning on both solid and linear models.



Extra heavy duty cast iron bases, saddles and tables provide proven damping capacity far superior to machines with cheaper fabricated frames.

Saddle and table are driven by extra heavy duty 40mm pre-tensioned double nut ballscrews to eliminate backlash and ensure long term accuracy. The ballscrews are pre-tensioned and supported at both ends with double angular contact precision bearings.



All 3 axes are checked by a laser inspection system to ensure positioning accuracy and repeatability.

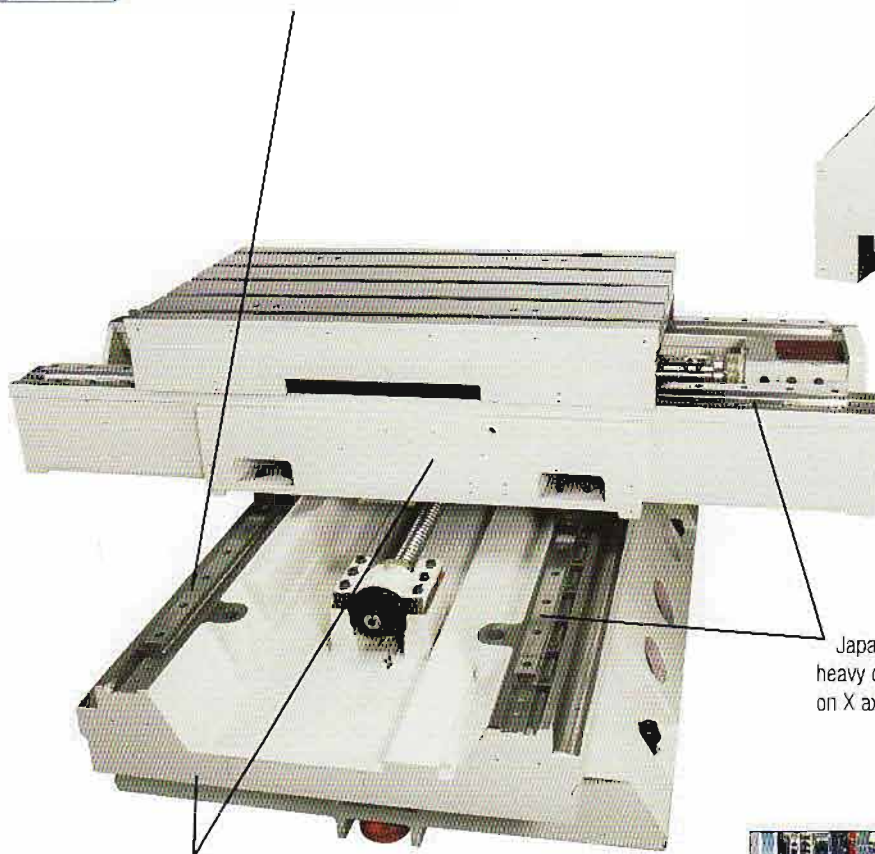
Linear Ways on L Models

For high speed applications requiring high rapid traverse rates and high accuracy, linear guideway machines are the optimum choice.

All Richmond L models from VMC 500L to 1020L feature heavy section linear ways.



Richmond machines employ the latest linear rail technology providing higher rigidity and more consistent accuracy. Recirculating balls contact the surface at 45° allowing the same dynamic load to be applied bi-directionally to both axis ensuring greater long term accuracy and load carrying capacity.



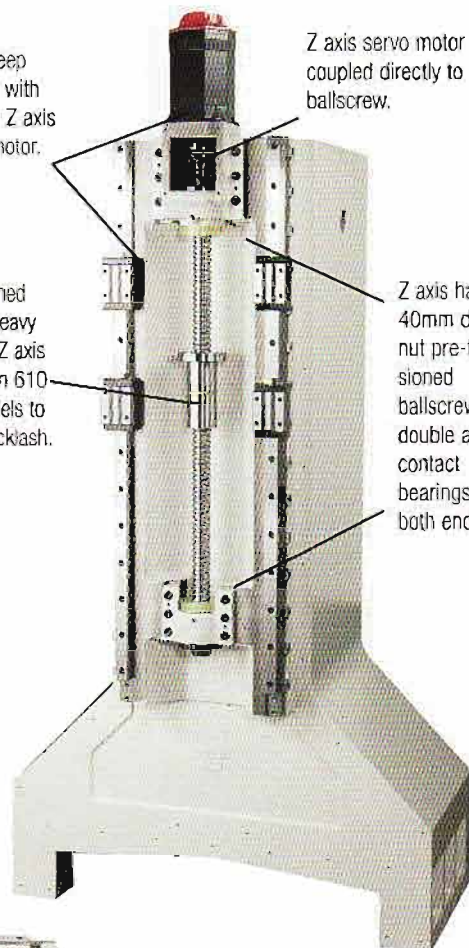
Extra heavy duty "Meehanite" cast iron base and saddle ensures proven thermal and mechanical rigidity, plus vibration absorption which are extremely important characteristics necessary for heavy loads and high speed traverses. (Fabricated frames simply do not compare).

Extra deep column with integral Z axis servo motor.

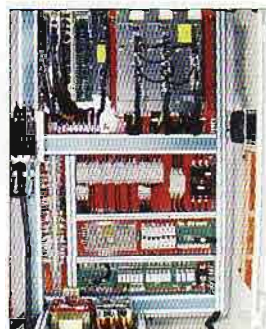
Z axis servo motor coupled directly to ballscrew.

Pre-tensioned double nut heavy duty 40mm Z axis ballscrews on 610 - 1300 models to minimise backlash.

Z axis has 40mm double nut pre-tensioned ballscrew and double angular contact bearings at both ends.

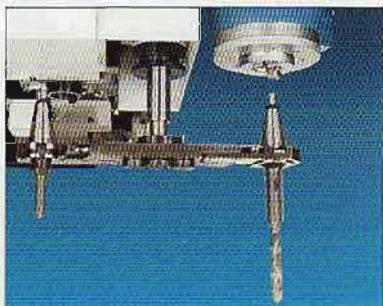


Japanese high precision "Tsubaki" heavy duty linear guideways, H30 ER on X axis, H35 ER on Y/Z axes giving smooth, accurate operation.



High quality electrical components and circuits. Electrical interface uses PC boards for greater reliability and easy maintenance.

High-speed Precision Operation



Choice of either Geneva type carousel toolchangers with 16 or 20 tools and 10 seconds toolchange time or our own high performance 24 tool twin arm high speed changer with 2.5 seconds toolchange time. (alternative options on larger and smaller models).



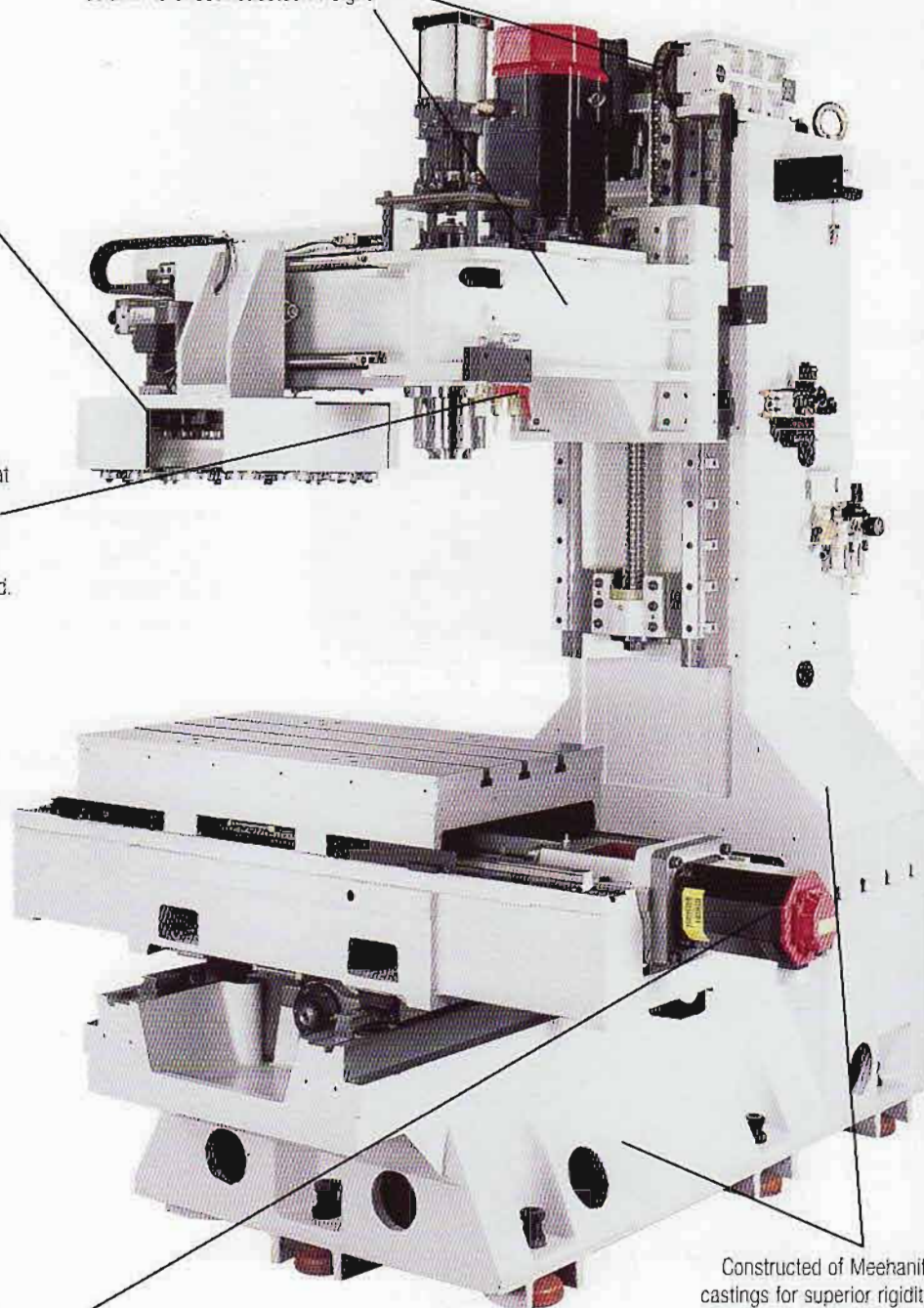
Coolant flows through easily adjustable nozzles at 36 litres/min, which you can direct exactly at the cut, this can be either M code or manually activated.

- All ways are covered by stainless steel way covers to protect ways and ball screws from dust and coolant.
- Swarf and coolant tray has swivel rollers for quick and easy cleaning and maintenance.



High speed brushless AC servo motors, superior to brush type motors, are directly coupled to the ballscrews, resulting in sharper corner cuts, more precise circular interpolation and higher positioning accuracy. Single source motors and drives used throughout. Fanuc Motors and drives with Fanuc CNC and Anilam with Anilam

Mechanical counterbalance inside column to offset headstock weight.



Constructed of Meehanite castings for superior rigidity, wear resistance and vibration absorption.

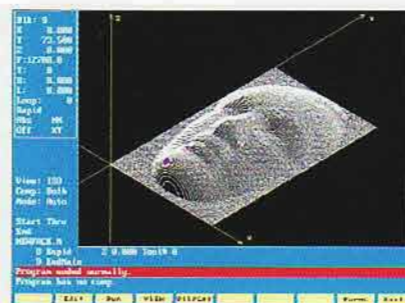
ANILAM 6000M

Conversational programming, standard G-Code or CAM, it's your choice...



The Anilam control package is ideally suited to users looking for a powerful, high specification digital control with both conversational and G code programming capability. Alternatively programs can be created using Anilam's integrated CAD/CAM system with on line post processor.

The 6000M control provides 4 axis simultaneous capability and is packed with operator features. With up to 4 GB of program memory and Ethernet fitted as standard, this control is ideal for the Die and mold making industry.



Basic & Advanced Canned Cycles		
Advanced <ul style="list-style-type: none"> • Helical interpolation • Polar interpolation • Conical interpolation • Rectangular draft pockets • Parametric programming • Tapered thread milling • Spindle probe cycles • Irregular pocketing with islands 	<ul style="list-style-type: none"> • Mirror • Ellipse • Scaling • Rotation • Tool probe cycles 	<ul style="list-style-type: none"> • Uni-directional boring • Rigid tapping • Hole patterns • Circular pockets • Rectangular pockets • Face milling • Linear interpolation • Circular interpolation
	Basic <ul style="list-style-type: none"> • Drill • Peck drill • Counter boring 	

CAM

Complex contours and pockets can still be programmed at the control using the integrated CAD/CAM system. Standard geometry tools such as line circle, arcs and points allow any 2D shape to be constructed.

FANUC Oi MC

Industry Leading CNC Technology



The Fanuc control is the system of choice for users looking for Industry leading quality with high performance and reliability. The new Fanuc Oi MC control used on Richmond machines is loaded with over 200 standard features and is the ideal choice for production applications where reliability, speed and program portability are important.

MANUAL GUIDE i

This recommended option is the latest and most powerful conversational programming system from FANUC. It offers the most comprehensive and feature laden aid that any programmer could want.



SIMULATION AND ANIMATION

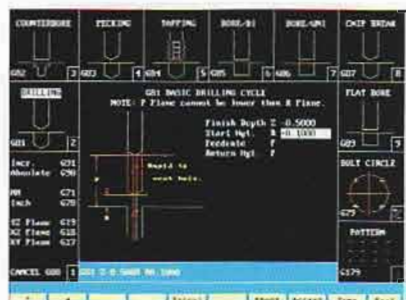
Manual Guide i has a more powerful graphics package than many commercial CAD/CAM systems. After a programme has been created, a simulated component can be viewed in any direction, or as a 3D model that can be cut or sectioned or magnified to see detail.

This simulated component can then be animated to show the cutting process, the toolpath, metal removal and the finished component to ensure that what you get is what you have programmed and exactly what you want.

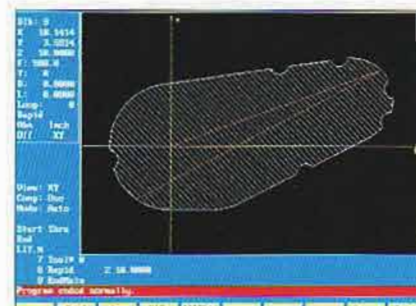
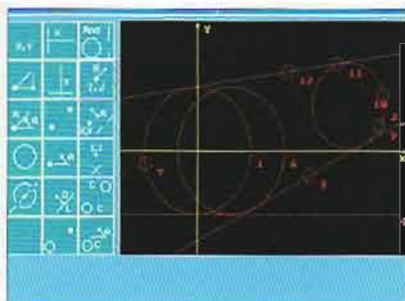


VMC Control Options

Conversational Programming



With ANILAM's geometry calculator all geometric elements (points, lines and circles) can be entered. Intersecting points are automatically recalled to the conversational screen.



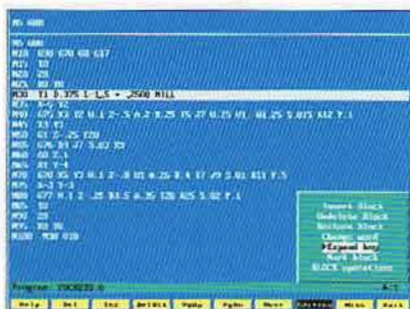
Using the conversational programming language, the full compliment of canned cycles and the integrated geometric calculator, complex parts can be programmed easily on the VMC.

Part programs can be simulated before execution using the draw graphics mode. Any magnification or orientation can be selected to view the toolpath.

Basic drilling canned cycle example....

All canned cycles require the minimum of inputs. This reduces the number of key strokes required minimising program errors and improving programming speed.

For those who prefer it, the 6000 series control may be programmed in standard G-Code language.



G-Code Programming

FULL SCREEN EDITING

Experienced G-Code programmers will appreciate the 6000's full screen program page. Advanced editing operations such as cut, copy and paste etc. make program changes fast and easy. Anilam's unique recovery features such as undelete block, restore block and restore program means that programming mistakes are both easily rectified and never permanent.



Help Menu

New users can take advantage of the Help Menu to create entire G-Code programs. Help is available for any program-mable function, from a simple rapid move to more advanced pocketing cycles.

CNC MILLING GRAPHICAL

The real strength of Manual Guide *z* is that it is effectively a CNC Graphical User interface. All the time you are working in Manual Guide *z*, the OIMC is creating a CNC program in the background. This means that conversion from conversational mode to CNC mode is instant. It also means that you can work in either CNC or conversational mode or even both at the same time. Furthermore it means that industry standard CNC programs can be loaded into or out of the control at any time.



LOADED WITH FEATURES SUCH AS...

- Rigid tapping
- Three axis interpolation
- Inch/metric data selection
- Programmable resolution-.00004"
- 400 tool length offsets
- Cutter diameter compensation
- LCD colour screen
- Background editing
- Custom macro B
- Extended part program editing
- 128K part program storage
- Pocket milling macros
- Scaling
- Sub program nesting
- Tool life management
- Absolute/incremental (X-, Y-, Z- and B- Axis)
- Canned cycles
- Spindle speed, feed rate, rapid traverse override
- Helical and polar interpolation
- Manual reference point return
- Run time parts counter
- Sequence number search
- Single block operation
- Tool compensation
- Tool length compensation
- And much more

CONTROL FEATURES

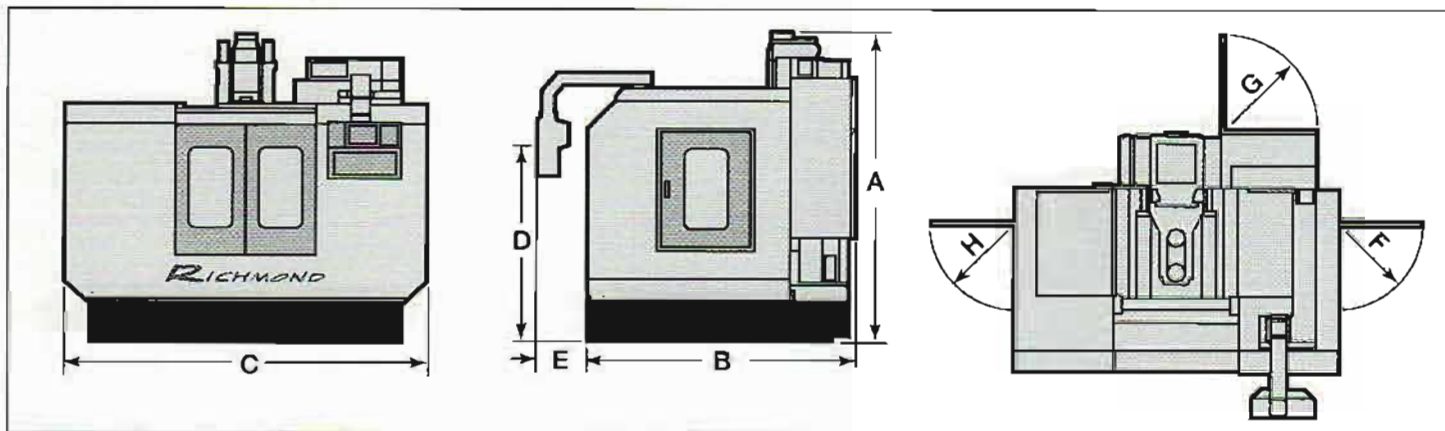
- PCMCIA port on the front of the CNC takes memory card for program storage retrieval and transfers as well as DNC operation direct from the memory card.
- High definition 8.6" colour LCD screen (10.4" with Manual Guide i)

Specifications and Optional Equipment

Machine Specifications						
Model	VMC500L	VMC610L/S	VMC850L/S	VMC1020L/S	VMC1300S	VMC1600S
Table						
Dimensions (mm)	600 x 320	800 x 450	1000 x 500	1200 x 500	1400 x 600	1700 x 815
Number of T-slots	3	3	5	5	5	5
T-slot width (mm)	14	18	18	18	18	22
T-slots centre (mm)	100	100	100	100	100	150
Table load (kg)	370	550	1,000 (1200 on S)	1,000 (1200 on S)	1,500	2,200
Work Travels						
X axis (long.) Linear Ways (mm)	510	610	850	1020	-	-
X axis (long.) Solid Ways (mm)	-	650	850	1020	1300	1600
Y axis (cross)	410	460	510	510	650	800
Z axis (vertical) Linear Ways (mm)	460	450	560	560	-	-
Z axis (vertical) Solid Ways (mm)	-	510	560	560	710	850
Spindle nose to table						
Linear Ways (mm)	127 - 587	125 - 635	150 - 710	150 - 710	-	-
Solid Ways (mm)	-	125 - 635	145 - 705	145 - 705	150 - 860	200 - 900
Spindle center to column						
Linear Ways (mm)	430	553	608	608	-	-
Solid Ways (mm)	-	535	575	575	700	700
Way dimensions						
Linear Ways (mm)	X-25/Y&Z-30	X-30/Y&Z-35	35	35	-	-
Solid Way Width (mm)	-	100	110	110	100 outer/75 inner	100 outer/90 inner
Table center to column						
Linear Ways (mm)	225 - 635	323 - 783	353 - 863	353 - 863	-	-
Solid Ways (mm)	-	305 - 765	320 - 830	320 - 830	375 - 1025	450 - 1200
Ballscrew dia./pitch (mm)	32/12	40/12	40/12	40/12	40/10	40/10
Spindle						
Spindle Motor (FANUC) (kw)	5.5	11	11	11	11	15
Spindle Motor (ANILAM) (kw)	7.5	11	11	11	11	15
Spindle Motor (option) (kw)	-	15	11	15	15	22
Spindle Taper	BT 40	BT 40	BT 40	BT 40	BT 40/50	BT 40/50
Spindle Speed (rpm)	8,000	8,000	8,000	8,000	8,000 / 5,000rpm BT50	8,000
Option #1 Spindle Speed (rpm)	10,000	10,000	10,000	10,000	10,000	10,000 / 4,000rpm BT50
Option #2 Spindle Speed (rpm)	12,000	12,000	12,000	12,000	12,000	12,000 / 6,000rpm BT50
Feed Rates						
Rapid traverse Linear Ways	36 m/min	36 m/min	36 m/min	36 m/min	-	-
Rapid traverse Solid Ways	-	24 m/min	24m /min	24m /min	X/Y-15 Z-12m/min	X/Y-15 Z-12m/min
Cutting Feed Rate	1-10000 mm/min	1-10000 mm/min	1-10000 mm/min	1-10000 mm/min	1-5000 mm/min	1-5000 mm/min
Auto Tool Changer						
Standard	12 Geneva Type	16 Geneva	16 Geneva	16 Geneva	20 Geneva	24 Twin Arm
Option 1	20 Geneva Type	20 Geneva	20 Geneva	20 Geneva	24 Twin Arm	32 Twin Arm
Option 2	-	24 Twin Arm	24 Twin Arm	24 Twin Arm	32 Twin Arm	-
Option 3	-	-	32 Twin Arm	32 Twin Arm	-	-
Max. Tool Dia. (mm)	150	150	150	150	100	250
Max. Tool Length (mm)	200	300	300	300	250	300
Max. Tool Weight (kg)	6	6	6	6	6	15
Tool Shank	BT or CAT 30/40	BT or CAT 40	BT or CAT 40	BT or CAT 40	BT or CAT 40/50	BT or CAT 40/50
Machine Accuracy						
Positioning (mm)	0.005	0.005	0.005	0.005	0.005	0.005
Repeatability (mm)	±0.0025	±0.0025	±0.0025	±0.0025	±0.003	±0.003
Weight						
Weight Linear Ways (kg)	2,200	3,200	4,800	5,000	-	-
Weight Solid Ways (kg)	-	3,400	5,000	5,200	7,200	14,000

Specifications and design are subject to change without notice or obligation.

RICHMOND VMC Range



Model	VMC500	VMC610	VMC850	VMC1020	VMC1300	VMC1600
Height A	2200mm	2300mm	2600mm	2600mm	2770mm	3220mm
Width B	2000mm	2300mm	2150mm	2150mm	2670mm	3150mm*
Length C	2200mm	2200mm	2700mm	2960mm	3250mm	4400mm
Control Ht. D	1400mm	1400mm	1400mm	1400mm	1550mm	1500mm
E	483mm	472mm	380mm	483mm	140mm	220mm
F	710mm	710mm	750mm	700mm	710mm	850mm
G	850mm	850mm	850mm	850mm	850mm	970mm
H	710mm	710mm	710mm	710mm	710mm	850mm

*3500mm with 32 tool option

Standard Equipment

- Geneva type carousel toolchanger
- Auto central oil lubrication
- Coolant system
- Electrical cabinet heat exchanger
- RS 232 port and cable
- Status Beacon
- Portable MPG handwheel
- Automatic Power Off
- Full guarding
- Halogen work light
- Rigid tapping
- Removable swarf tray
- Programmable air blast
- Telescopic covers XY and Z
- Levelling bolts, pads, toolbox and tools
- Operating manual and test sheets

Optional Equipment

- 4th Axis Interface, Motor & Drive
- Swarf Flushing System*
- Through Spindle Coolant Filter System
- Through Spindle Coolant*
- Spindle Oil Coolant for VMC500 & VMC1600*
- Electrical Cabinet Air Conditioning
- Auto Door Open and Close*
- Pull studs for 12, 16 or 20 tool ATC
- Pallet Loader
- Tooling Package
- 10,000rpm Spindle with Oil Cooler*
- 12,000 rpm Spindle with Oil Cooler*
- ZF Gear Box for 8000 rpm Machines*
- Higher Capacity Carousel type Toolchanger*
- High Speed 24 Tool Twin Arm Toolchanger*
- Chain Type 32 Tool ATC for VMC1020 VMC1300 & VMC1600*
- Belt Type Swarf Conveyor for VMC 610 and larger
- Screw Type Swarf Conveyor*
- 6000 rpm Spindle for VMC1600*
- Full Guarding for VMC1600*
- BT 50 Option on VMC 1300S Includes spindle Oil Cooling and 4th axis prep*

*Factory Installed

600 Group Manufactured Products



Colchester is the World's best known lathe company offering a range of conventional lathes, MultiTurn flat bed CNC lathes and Tornado CNC lathes, Turning Centres and Lights – Out solutions. www.colchester.co.uk



Crawford Collets offers the widest range of Collets, Feed Fingers and Collet Chucks in the world. Renowned for very high quality Crawford have over 30,000 items permanently in stock. www.crawford-collets.co.uk



Electrox Laser Marking Systems allow you to mark your products with serial numbers, logos or other identification permanently and safely. www.electrox.com



Gamet is the World's only specialist manufacturer of Ultra High precision tapered roller bearings for machine tool and other precision industries and also offers ballscrew bearings and cartridges. www.gamet-bearings.co.uk



Harrison makes the World's most popular combination Manual/CNC range of Alpha lathes as well as a full range of conventional lathes. www.harrison.co.uk



Parat Toolposts are the industry standard for Quick Change precision toolholding on lathes and other applications www.parat-wzm.de



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www.600group.com

Richmond Machine Tools

Gelders Hall Road, Shepshed, Loughborough Leicestershire LE12 9NH

Tel: +44 (0)1509 600600 Fax: +44 (0)1509 600159

www.richmondmachinetools.com

mail@richmondmachinetools.com