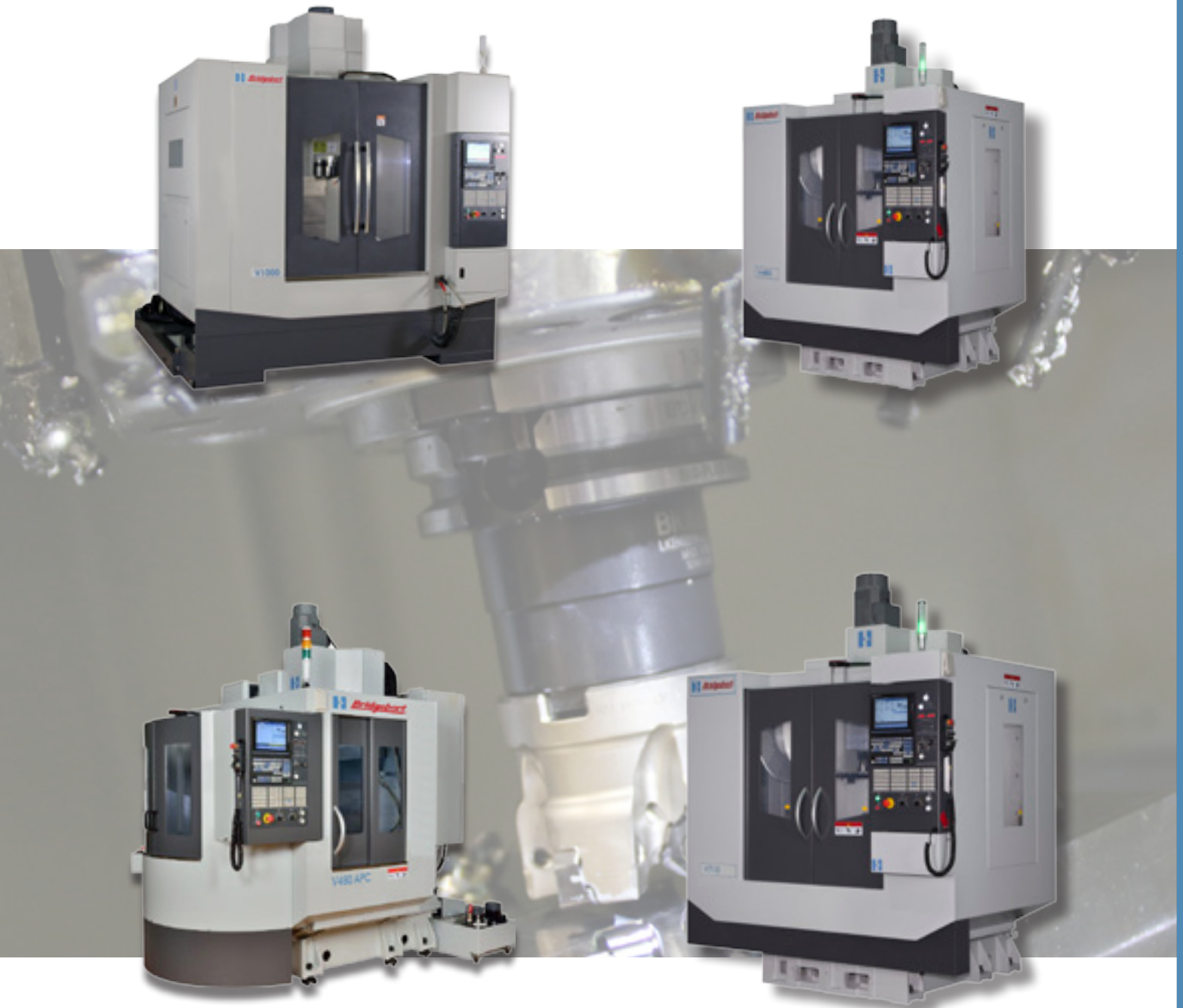


MILLING

# BRIDGEPORT

## VSeries

### Vertical Machining Centers



[www.bpt.com](http://www.bpt.com)



# V SERIES VERTICAL MACHINING CENTERS

## V Series Performance Turning Centers

Exceptional combination of features for speed, power, accuracy and durability in a compact design and affordable price

V Series turning centers are rigid and reliable machines that feature a robust one-piece cast iron base, heavy-duty linear guideways and ballscrews, and many standard value-added features like:

- heavy-duty dual-wound spindle motor
- 40-psi through-tool and headwall coolant
- foot switch
- chip conveyor interface
- air hose with air gun
- swing-out CNC control panel

Our standard Mitsubishi CNC control includes many value-added features that are offered as options by other machine builders. Choose from the numerous productivity options and you'll have a truly versatile machine—and with the level of quality you would expect with any Bridgeport product.

### V480

- X,Y,Z travel (18.9, 15.75, 16.93")
- 7.5 / 10 hp
- 10,000 rpm spindle speed
- 35 ft/lb torque
- Swing arm style ATC, 20 station
- Mitsubishi M70 control



### V480 APC

- X,Y,Z travel (18.9, 15.75, 16.93")
- 7.5 / 10 hp
- 10,000 rpm spindle speed
- 35 ft/lb torque
- Swing arm style ATC, 20 station
- Mitsubishi M70 control or FANUC 0iMD control



### V710

- X,Y,Z travel (27.95, 15.75, 16.93")
- 7.5 / 10 hp
- 10,000 rpm spindle speed
- 35 ft/lb torque
- Swing arm style ATC, 20 station
- Mitsubishi M70 control



### VI000

- X,Y,Z travel (40.16, 24, 24")
- 20 / 25 / 29.5 hp
- 10,000 rpm spindle speed
- 110.6 ft/lb torque
- Swing arm style ATC, 30 station
- Mitsubishi M70 control



## Bridgeport V480

Bridgeport's high quality, highly specified Vertical Machining Center, the Bridgeport V480 is an extremely compact yet rugged machine; developed for applications that require speed as well as accuracy.

The Bridgeport V480 is manufactured from quality sourced grey cast iron to the highest standards and possesses a level of reliability unsurpassed in the industry. A fully digital machine with a rapid traverse rate of 1,417 ipm X,Y and Z and acceleration rates of X: 6 m/sec<sup>2</sup> / Y: 4.6 m/sec<sup>2</sup> / Z: 3.75 m/sec<sup>2</sup> providing a fast and accurate response to all your machining needs.

The Bridgeport V480 is ideal whether you are a job shop or OEM, the machine was designed with flexibility and throughput in mind.

## Included Machine Features

- CNC Control – Mitsubishi M70
- 10.4" color LCD
- CT40 or BT40 - Big Plus
- Manual Chip Wash Gun
- Auto Power Off
- Central Greased Pump (manual)
- LED-Work Light
- Fully interlocked machine guarding
- Prep for Through Spindle Coolant 280/1000 PSI
- Embedded Ethernet, NAVI-MILL
- 10,000 RPM, Direct coupled greased Spindle
- Circular Flushing Ring
- Coolant chip flush system
- Hand Held Pulse Generator (MPG)
- Three Color Stack Light
- 20 Tool ATC



## Options

- 12,000 RPM - Air /Oil Lube, Direct Coupled, Big Plus Spindle, Hollow Shaft Motor, Spindle Chiller (Factory order only)
- 15,000 RPM - Air /Oil Lube, Direct Coupled, Big Plus Spindle, Hollow Shaft Motor, Spindle Chiller (Factory order only)
- CTS - Deublin Rotary Union
- Through spindle coolant 280 PSI (Factory order only)
- Air blast for dry cutting
- Chip Conveyor Hinge Type (interface included as standard equipment) (Factory order only)
- Chip Conveyor Scraper Type (interface included as standard equipment) (Factory order only)
- Additional Spare M codes (8 Set)
- External High Voltage Transformer, 25KVA, 380-440V, 50/60HZ (Factory order only)
- X/Y/Z Axis Auto Greased Lubrication in lieu of Manual Greased Lubrication (Factory order only)
- Probe pre-wire kit OMP-40-2 + OTS

# STANDARD FEATURES

## V710

### Bridgeport V710

Bridgeport's high quality, highly specified Vertical Machining Center; the Bridgeport V710 is a lightening quick extremely compact yet rugged machine; developed for applications that require speed as well as accuracy. The Bridgeport V710 is manufactured from quality sourced grey cast iron to the highest standards and possesses a level of reliability unsurpassed in the industry. A fully digital machine with a rapid traverse rate of 1,417 ipm X,Y and Z providing a fast and accurate response to all your machining needs.

The Bridgeport V710 is ideal whether you are a job shop or OEM, the machine was designed with flexibility and throughput in mind.

### Included Machine Features

- CNC Control – Mitsubishi M70
- 10.4" color LCD
- CT40 or BT40 - Big Plus
- Manual Chip Wash Gun
- Auto Power Off
- Central Greased Pump (manual)
- LED-Work Light
- Fully interlocked machine guarding
- Prep for Through Spindle Coolant 280/1000 PSI
- Embedded Ethernet, NAVI-MILL
- 10,000 RPM, Direct coupled greased Spindle
- Circular Flushing Ring
- Coolant chip flush system
- Hand Held Pulse Generator (MPG)
- Three Color Stack Light
- 20 Tool ATC

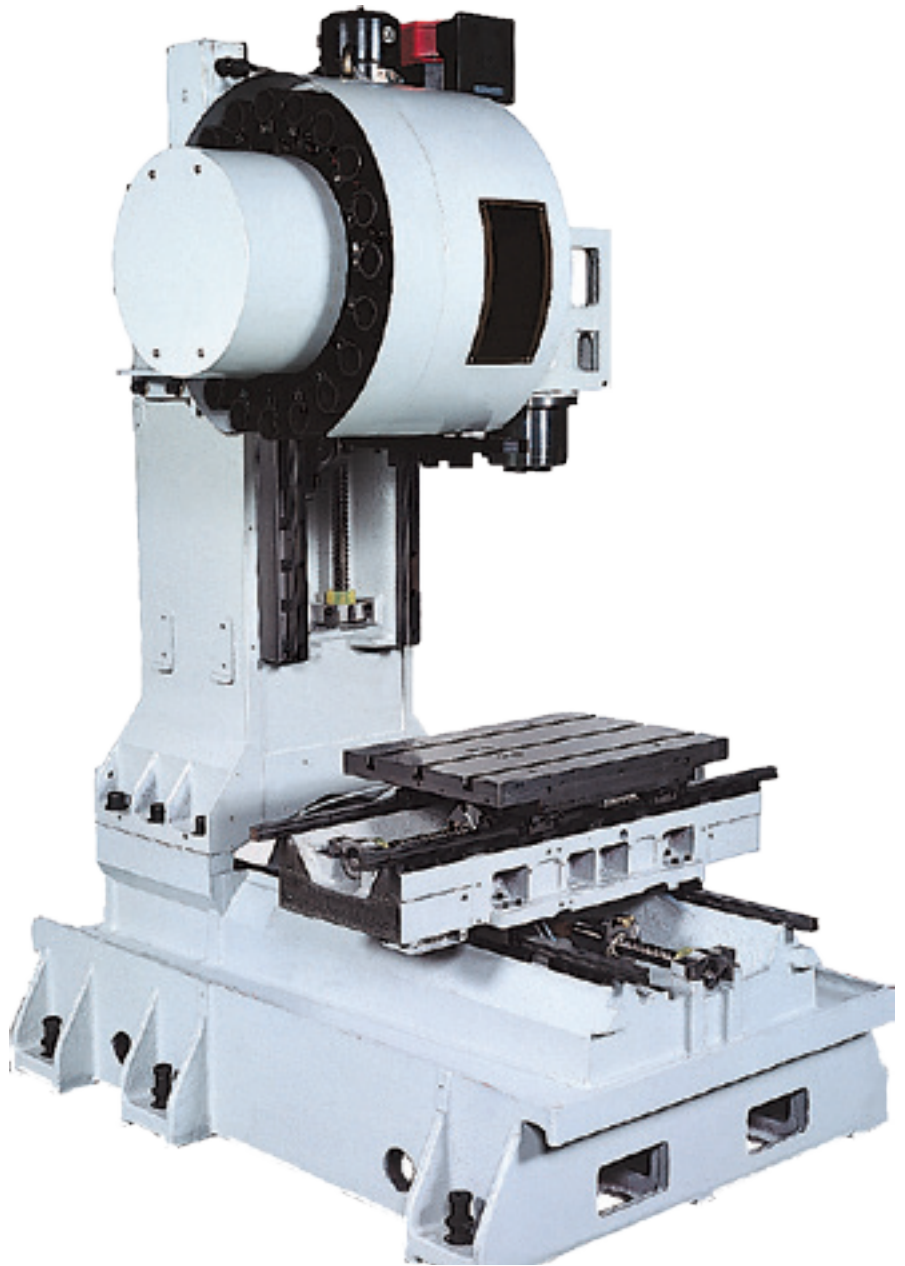


### Options

- 12,000 RPM - Air /Oil Lube, Direct Coupled, Big Plus Spindle, Hollow Shaft Motor, Spindle Chiller (Factory order only)
- 15,000 RPM - Air /Oil Lube, Direct Coupled, Big Plus Spindle, Hollow Shaft Motor, Spindle Chiller. (Factory order only)
- CTS - Deublin Rotary Union
- Through spindle coolant 280 PSI (Factory order only)
- Air blast for dry cutting
- Chip Conveyor Hinge Type (interface included as standard equipment) (Factory order only)
- Chip Conveyor Scraper Type (interface included as standard equipment) (Factory order only)
- Additional Spare M codes (8 Set)
- External High Voltage Transformer, 25KVA, 380-440V, 50/60HZ (Factory order only)
- X/Y/Z Axis Auto Greased Lubrication in lieu of Manual Greased Lubrication (Factory order only)
- Probe pre-wire kit OMP-40-2 + OTS

### Machine Structure

- Robust C-frame fixed column design.
- Spindle carrier, column and base are manufactured from high-quality cast iron, contributing to overall rigidity and machining capabilities.
- Low inertia coupling connect between ball screws and axial servo motor directly.



### Machine Base

- Ground ball screw features low noise, low thermal growth and heavy duty transmission.
- Two linear guideways on X axis and two guide blocks per guideway.
- Y and Z axes feature two linear guideways with two heavy duty guide blocks per guideway.

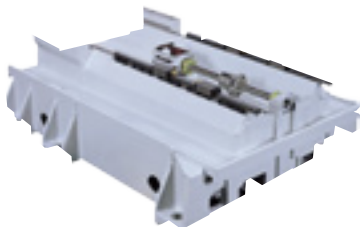


# KEY FEATURES

## V480/V710

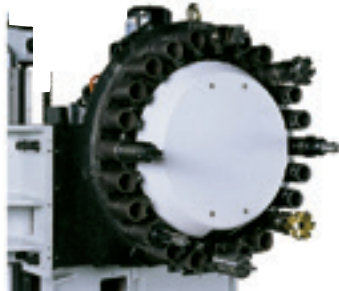
### Heavy Duty Linear Guideways, Ballscrews and Axis Drives

Wide-spaced, oversized linear guideways provide optimum stiffness with less friction, less heat and less thermal growth for faster traverse rates, longer machine life and greater positioning accuracy. The linear way modules consist of slide members (guide trucks) and linear rails to provide a large load rating, stable accuracy, high rigidity and low friction. The wide spacing between all axes rails provides optimum stiffness for the overall machine structure.



### Large Capacity, fast performance automatic tool changers

V480 and V710 VMC's have a fast tool change time of 1.5 seconds (Tool-Tool). The design of random bi-directional ATCs with inverter drive motor provides accurate, rapid and stable tool change system. 90 degree tool pocket prevents tool dropping.



### Advanced digital control to unleash your productivity

V480 and V710 VMC's feature a powerful Mitsubishi M70 Type A CNC control with the latest hardware and software technology, providing an operator-friendly, common platform. Many standard features are included that other machine tool builders charge extra for rigid tapping, tool life management are just some of those features. In addition, the control comes standard with NAVI-MILL conversational programming.

### BIG-PLUS direct coupled spindle system

The BIG-PLUS spindle system assures higher rigidity, stiffness and accuracy of tool holders in high-speed and difficult machining applications. The direct coupled system precisely positions the toolholder within 1 micron following a tool change.

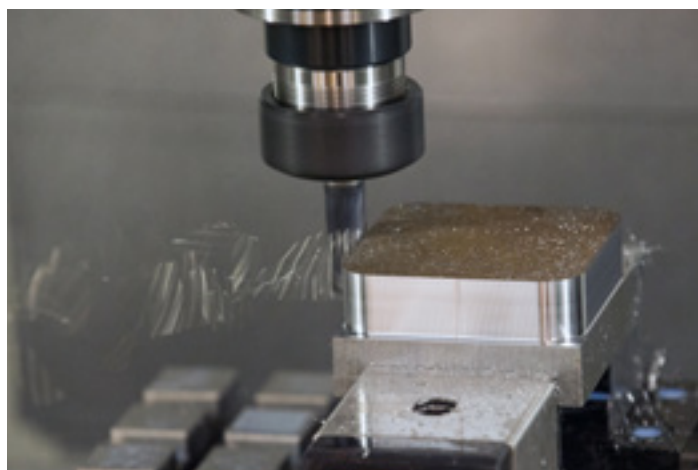


### Elimination of Z-axis movement

At High rotational spindle speeds, the mouth of the machine spindle can expand slightly due to centrifugal force. As the machine spindle expands, the conventional toolholder, which under constant draw bar pulling pressure, moves further into the spindle. On high tolerance applications, this slight pull back of the cutter can affect dimensional accuracy of the Z-axis. Pull back can also cause the toolholder to get locked into the machine spindle taper. The face contact provided by the BIG-PLUS Spindle System prevents the toolholder from being drawn back into the machine spindle.

### Hardinge Rotary Solutions

Hardinge Rotary Systems can be integrated into the V480 and V710 VMC's, operating in a fully interpolated fashion with the other axes of the machine. The machining center must be configured for immediate or future 4th-axis operation. Refer to brochure 2372 for a complete rotary product offering with dimensions and specifications.

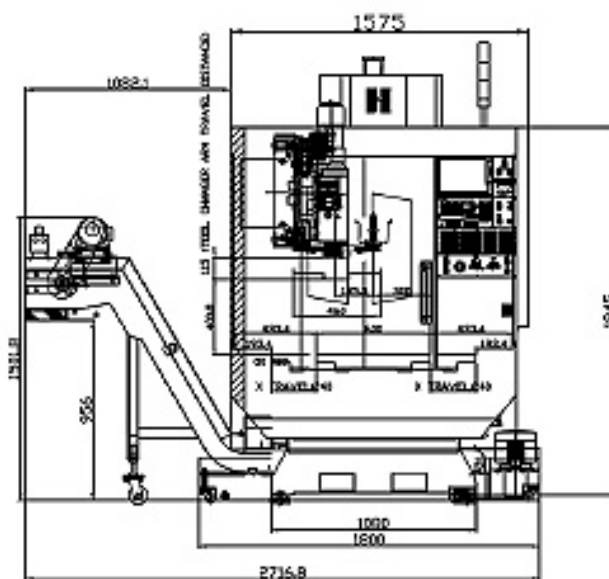


Axis Travel	
Table (X axis)	18.9" (480mm)
Saddle (Y axis)	15.75" (400mm)
Head (Z axis)	16.93" (430mm)
Positioning	
Auto Mode (X and Y axes)	1,417 in/min
Auto Mode (Z axis)	1,417 in/min.
Feedrate Range (X,Y,Z axes)	0.1-472 in/min.
Minimum Programmable Res.	0.0001" (0.001mm)
Ball Screw Diameter and Pitch (X,Y,Z)	1.26" x .472" (32 x 12mm)
Spindle	
Spindle Speed Range	10,000 rpm
Spindle Motor HP Rating (CT/30 min)	7.5/10 hp (5.5/7.5)
Spindle Torque (15 Min) base speed at 1500RPM	35 ft. /lbs
Retention Force	1433 lbs
Spindle Taper	No. 40
Worktable	
Working surface	23.6 x 15.8" (600 x 400mm)
Table load	661 lbs. (300 kg)
Number of T-Slots	3 on 4.92" (125mm) centers
T-Slot Size	.551" (14mm)
Swing Arm Style ATC	
Type of tool shank	BT40 or CT40 taper
Magazine capacity	20 Tools
Tool Select by Shortest Path and Random Select	Bi-Directional
Maximum tool diameter (Full Drum)	2.95" (80mm)
Maximum tool diameter (Adjacent Pockets empty)	5.9" (150mm)
Maximum Tool Length	7.48" (190mm)
Maximum Tool Weight	15.7 lbs. (7kg)
Random Tool change time (tool to tool/chip to chip)	1.5/3.8 sec.
Coolant	
Coolant tank capacity	44.9 US gallons (170L)
Accuracy	
Positioning	+/- 0.00039 in. (+/- 0.01mm)
Repeatability	+/- 0.000196 in. (+/- 0.005mm)
Machine Size	
Height	101.26" (2572mm)
Floor space (L x W)	106.96 x 104.69" (2716 x 2659mm)
Weight	8378 lbs (3,800 kg)

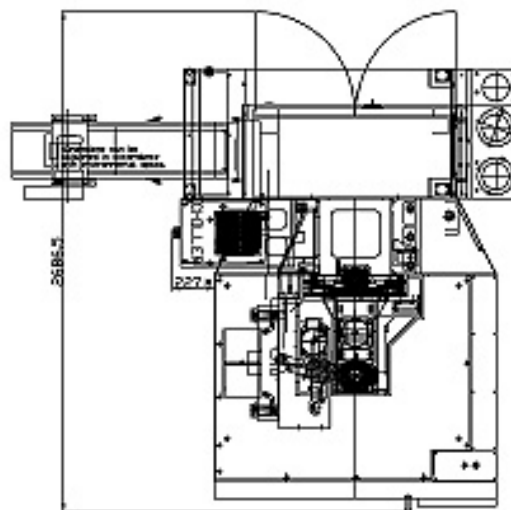
Service Requirements	
Electrical Supply (Input)	
Structure	Balanced 3-phase
Cycles	60 Hz
Power	65FLA
Voltage*	230 volt
Compressed Air (Pressure Flow)	70 PSI
Nozzle Coolant	10.5gal/min

\* Note: Other voltages require an external transformer

## V480 Floor Plan



Front view



Top view

# SPECIFICATIONS

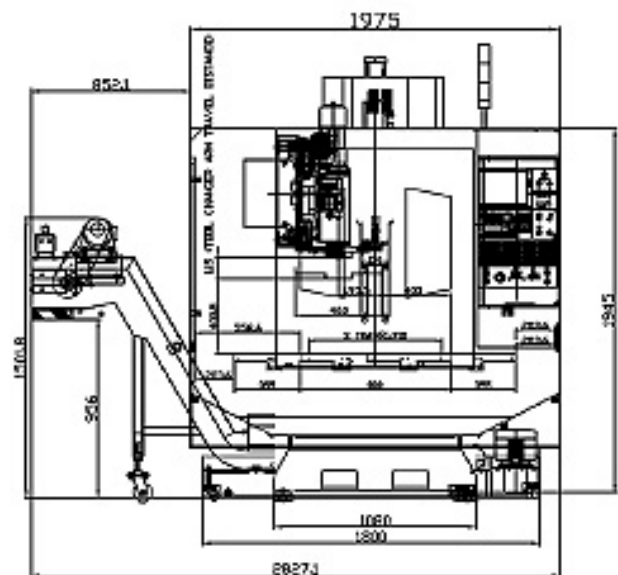
## V710

Axis Travel	
Table (X axis)	27.95" (710mm)
Saddle (Y axis)	15.75" (400mm)
Head (Z axis)	16.93" (430mm)
Positioning	
Auto Mode (X and Y axes)	1,417 in/min
Auto Mode (Z axis)	1,417 in/min.
Feedrate Range (X,Y,Z axes)	0.1-472 in/min.
Minimum Programmable Res.	0.0001" (0.001mm)
Ball Screw Diameter and Pitch (X,Y,Z)	1.26 x .472" (32 x 12mm)
Spindle	
Spindle Speed Range	10,000 rpm
Spindle Motor HP Rating (CT/30 min)	7.5/10 hp (5.5/7.5)
Spindle Torque (15 Min) base speed at 1500RPM	35 ft. lbs
Retention Force	1433 lbs
Spindle Taper	No. 40
Worktable	
Working surface	31.4 x 15.7" (800 x 400mm)
Table load	661 lbs. (300 kg)
Number of T-Slots	3 on 4.92" (125mm) centers
T-Slot Size	.551" (14mm)
Swing Arm Style ATC	
Type of tool shank	BT40 or CT40 taper
Magazine capacity	20 Tools
Tool Select by Shortest Path and Random Select	Bi-Directional
Maximum tool diameter (Full Drum)	2.95" (80mm)
Maximum tool diameter (Adjacent Pockets Empty)	5.9" (150mm)
Maximum Tool Length	7.48" (190mm)
Maximum Tool Weight	15.7 lbs. (7kg)
Random Tool change time (tool to tool/chip to chip)	1.5/3.8 sec.
Coolant	
Coolant tank capacity	44.9 US gallons (170L)
Accuracy	
Positioning	+/- 0.00039 in. (+/- 0.01mm)
Repeatability	+/- 0.000196 in. (+/- 0.005mm)
Machine Size	
Height	101.26" (2972mm)
Floor space (L x W)	111.3 x 104.69" (2827 x 2659mm)
Weight	8613 lbs (3,907 kg)

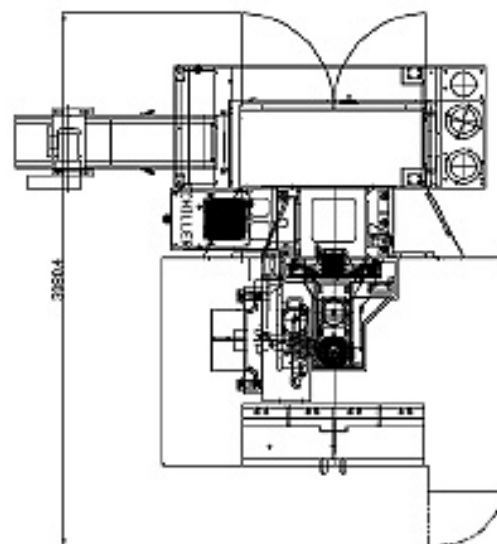
Service Requirements	
Electrical Supply (Input)	
Structure	Balanced 3-phase
Cycles	60 Hz
Power	65FLA
Voltage*	230 volt
Compressed Air (Pressure Flow)	70 PSI
Nozzle Coolant	10.5gal/min

\* Note: Other voltages require an external transformer

## V710 Floor Plan



Front view



Top view

### Bridgeport V480 APC

Bridgeport's high quality, highly specified Vertical Machining Center with Integrated Automatic Pallet Changing capability, the Bridgeport V480 APC is extremely compact yet rugged machine; developed for applications that require speed, accuracy as well as high volume production.

The Bridgeport V480 APC is manufactured from quality sourced grey cast iron to the highest standards and possesses a level of reliability unsurpassed in the industry. A fully digital machine with a rapid traverse rate of 1,417 ipm X,Y and Z and acceleration rates of X : 6 m/sec<sup>2</sup> / Y: 4.6 m/sec<sup>2</sup> / Z: 3.75 m/sec<sup>2</sup> providing a fast and accurate response to all your machining needs.

### Included Machine Features

- CNC Control - Mitsubishi M70 Type A Control
- 10.4" Color LCD Display with Full Keyboard
- CT40 or BT40 - Big Plus
- Manual Chip Wash Gun
- Auto Power Off
- Central Greased Pump (manual )
- LED-Work Light
- Fully interlocked machine guarding
- Prep for Through Spindle Coolant 280/1000 PSI
- Embedded Ethernet, NAVI-MILL
- 10,000 RPM, Direct coupled greased Spindle
- Circular Flushing Ring
- Coolant chip flush system
- Hand Held Pulse Generator (MPG)
- Three Color Stack Light
- 20 Tool ATC
- On board PCMCIA memory card slot
- USB Port
- Circular Flushing Ring
- ATC Driven By Inverter Drive
- Spindle air purge
- Oversize Tool function (4)

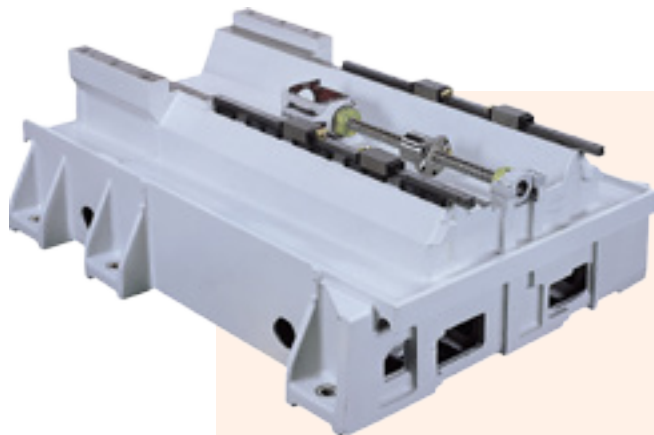
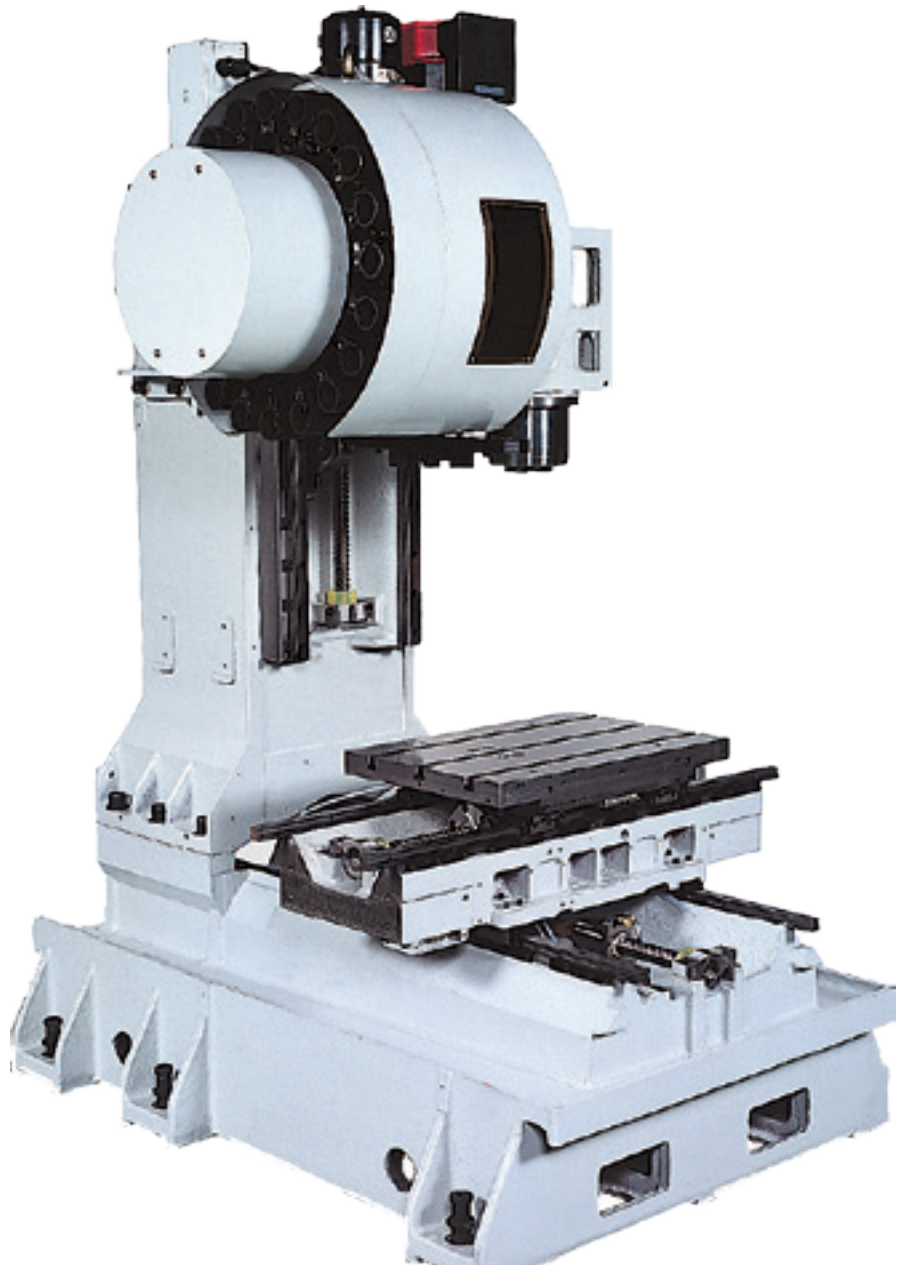


### Options

- 12,000 RPM - Air /Oil Lube, Direct Coupled, Big Plus Spindle, Hollow Shaft Motor, Spindle Chiller (Factory order only)
- 15,000 RPM - Air /Oil Lube, Direct Coupled, Big Plus Spindle, Hollow Shaft Motor, Spindle Chiller: (Factory order only)
- CTS - Deublin Rotary Union
- Through spindle coolant 280 PSI (Factory order only)
- Air blast for dry cutting
- Chip Conveyor Hinge Type (interface included as standard equipment) (Factory order only)
- Chip Conveyor Scraper Type (interface included as standard equipment) (Factory order only)
- Additional Spare M codes (8 Set)
- External High Voltage Transformer, 25KVA, 380-440V, 50/60HZ (Factory order only)
- X/Y/Z Axis Auto Greased Lubrication in lieu of Manual
- Greased Lubrication (Factory order only)

### Machine Structure

- Robust C-frame fixed column design.
- Spindle carrier, column and base are manufactured from high-quality cast iron, contributing to overall rigidity and machining capabilities.
- Low inertia coupling connect between ball screws and axial servo motor directly.



### Machine Base

- Ground ball screw features low noise, low thermal growth and heavy duty transmission.
- Two linear guideways on X axis and two guide blocks per guideway.
- Y and Z axes feature two linear guideways with two heavy duty guide blocks per guideway.

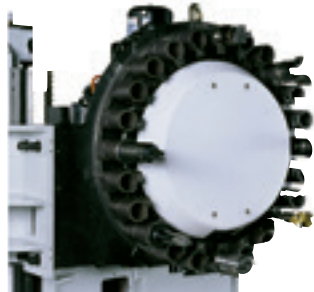
### Heavy duty linear guideways, ballscrews and axis drives

Wide-spaced linear guideways provide optimum stiffness with less friction, less heat and less thermal growth for faster traverse rates, longer machine life and greater positioning accuracy. The linear way modules consist of slide members (guide trucks) and linear rails to provide a large load rating, stable accuracy, high rigidity and low friction. The wide spacing between all axes rails provides optimum stiffness for the overall machine structure.



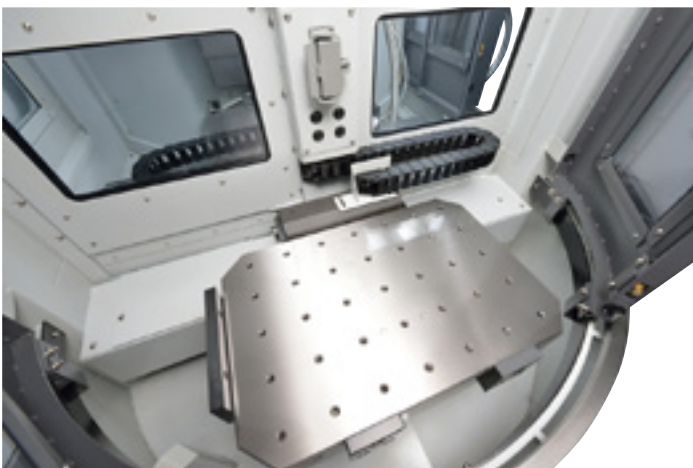
### Large capacity, fast performance automatic tool changers

The V480 APC have a fast tool change time of 1.5 seconds (Tool-Tool). The design of random bi-directional ATCs and cam type mechanism features accurate, rapid and stable tool change system. 90 degree tool pocket prevents tool dropping. All ATC's feature random-access, bi-directional indexing.



### Advanced digital control to unleash your productivity

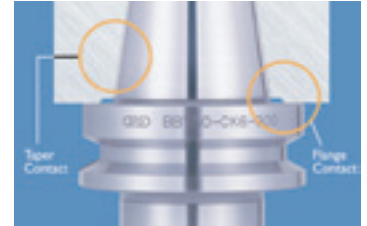
The V480 APC features a Mitsubishi or FANUC CNC control with the latest hardware and software technology, providing an operator-friendly, common platform. Many standard features are included that other machine tool builders charge extra for rigid tapping, tool life management, run time and parts counter are just some of those features.



### BIG-PLUS dual contact spindle system

The BIG-PLUS spindle system assures higher rigidity, stiffness and accuracy of tool holders in high-speed and difficult machining applications.

The dual contact precisely positions the toolholder within one micron following a tool change.



### Machine lubrication

The V480 APC utilizes Centralized Grease Lubrication for all ballscrews and linear guides for extended component life without contaminating cutting fluids as with way oil systems. Optional Auto Grease Lubrication is also available.

### Elimination of Z-axis movement – A benefit of BIG-PLUS®

At high rotational spindle speeds, the mouth of the machine spindle can expand slightly due to centrifugal force. As the machine spindle expands, the conventional toolholder, which under constant draw bar pulling pressure, moves further into the spindle. On high tolerance applications, this slight pull back of the cutter can affect dimensional accuracy of the Z-axis. Pull back can also cause the toolholder to get locked into the machine spindle taper. The face contact provided by the BIG-PLUS® Spindle System prevents the toolholder from being drawn back into the machine spindle increasing accuracy and tool life.

### Hardinge Rotary Solutions

Hardinge Rotary Systems can be integrated into the VSeries machines, operating in a fully interpolated fashion with the other axes of the machine. The machining center must be configured for immediate or future 4th-axis operation. Refer to brochure 2372 for a complete rotary product offering with dimensions and specifications.



# SPECIFICATIONS

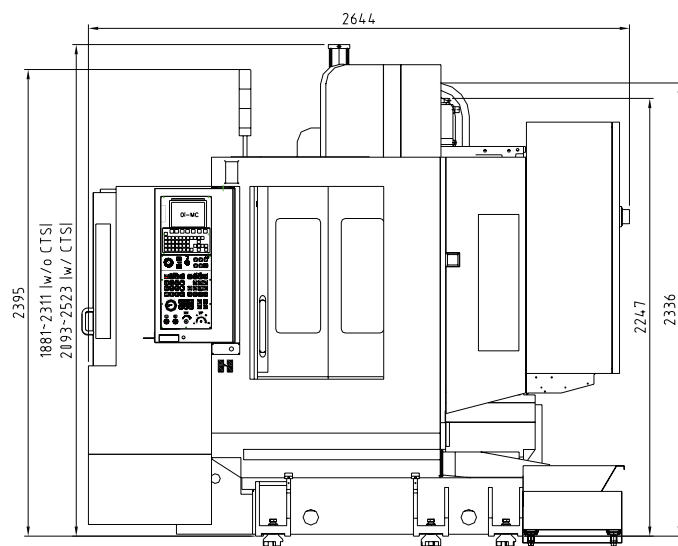
## V480 APC

Axis Travel	
Table (X axis)	18.9" (480mm)
Saddle (Y axis)	15.75" (400mm)
Head (Z axis)	16.93" (430mm)
Pallet Changer	
Automatic Pallet Changer (2 position front type)	23.6 x 15.8" (600 x 400mm)
Table Type	Turn Table
Clamping Force	2200kg @ 35kg/cm <sup>2</sup>
Table Screw Type	M12 x P1.75 x 35
Pallet Change Time	9sec. +/- 1 sec.
Positioning	
Auto Mode (X and Y axes)	1,417 in/min
Auto Mode (Z axis)	1,417 in/min.
Feedrate Range (X,Y and z axes)	0.1-472 in/min.
Minimum Programmable Res.	0.0001" (0.001mm)
Ball Screw Diameter and Pitch (X,Y,Z)	1.26 x .472" (32 x 12mm)
Spindle	
Spindle Speed Range	10,000 rpm
Spindle Motor HP Rating (CT/30 min)	7.5/10 hp (5.5/7.5)
Spindle Torque (15 Min) base speed at 1500RPM	35 ft. /lbs
Retention Force	1433 lbs
Spindle Taper	No. 40
Tool Holder	CT40 or BT40
Distance from table surface to spindle gauge plane	8.85 - 25.7" (225 - 655mm)
Swing Arm Style ATC	
Type of tool shank	BT40 or CT40 taper
Magazine capacity	20 Tools
Tool Select by Shortest Path and Random Select	Bi-Directional
Maximum tool diameter (Full Drum)	2.95" (74mm)
Maximum tool diameter (Adjacent Pockets Empty)	5.9" (150mm)
Maximum Tool Length	7.48" (190mm)
Maximum Tool Weight	15.7 lbs. (7kg)
Random Tool change time (tool to tool/chip to chip)	1.5/3.8 sec.
Coolant	
Coolant tank capacity	44.9 US gallons (170L)
Accuracy	
Positioning	+/- 0.00039 in. (+/- 0.01mm)
Repeatability	+/- 0.000196 in. (+/- 0.005mm)

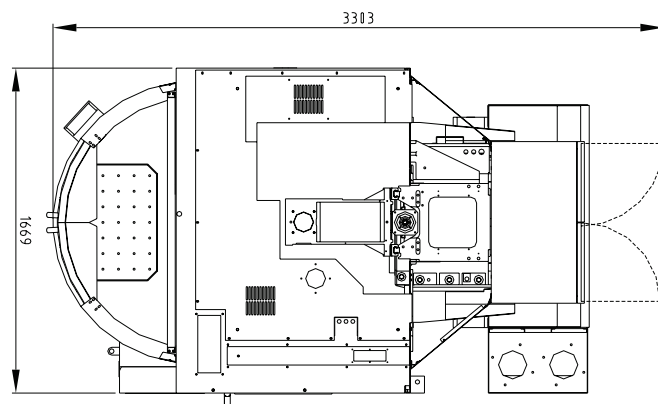
Machine Size	
Height	109.21" (2773mm)
Floor space (L x W)	106.97" x 109.37" (2717 x 2777mm)
Weight	9833lbs (4460kg)
Service Requirements	
Electrical Supply (Input)	
Structure	Balanced 3-phase
Cycles	60 Hz
Power	65FLA
Voltage*	230 volt
Compressed Air (Pressure Flow)	70 PSI
Nozzle Coolant	10.5gal/min

\* Note: Other voltages require an external transformer

## V480 APC Floor Plan



Front view



Top view

### Bridgeport VI000

Manufactured to the highest industry standards, the Bridgeport VI000 is packed with features to meet and exceed the requirements of the demanding metal-cutting market. This machine provides very fast rapid traverse of 1692 inches per minute on X&Y axes and 1417 inches per minute on the Z-axis and a highly sophisticated yet user-friendly Mitsubishi M70V control with NAVI-MILL Programming and 10.4" LCD. The machine features a powerful direct-drive 20HP, 10,000 RPM (12,000 & 15,000 RPM option) spindle motor with 110 ft-lbs of torque, and a 30-tool swing-arm automatic tool changer. The machine is designed for with outstanding rigidity. Large, robust 45mm ball screws are provided on all axes and 35mm linear guides are standard on the X-axis with 45 size guides on the Y & Z-axes.



### Included Machine Features

- Side access doors with windows
- Leveling pads and screws
- Manual central grease lubrication (X/Y/Z axes)
- Dual work light
- 3RD adjustable work light
- Three Color Stack light
- Retention knobs
- Spindle taper cleaner by air blast
- Inverter drive for ATC
- Tool kit
- Remote MPG
- Ethernet connection & USB port
- Surround spindle circulating flush
- Coolant chip flush
- Manual coolant wash gun
- Auto power off
- Through spindle coolant prep

### Options

- 12,000/15,000 rpm spindle w/air-oil mist
- 4th axis pre-wiring
- 4th axis drive package
- 5th axis drive package (4+1)
- Spare M-Codes (8)
- Part / tool probe (wireless)  
(OMP 40-2 + OTS with OMI-2T)
- Linear optical scale (X/Y/Z Axes)
- Column riser: 6" (150 mm)
- Cutter air blast (spindle side)
- Chip conveyor: hinge type / scraper type
- Coolant through spindle, 280 PSI or 1000 PSI
- Tool magazine autodoor
- Automatic central grease lubrication (X/Y/Z Axes)
- Spindle oil chiller (std. 12/15K spindle)

# MACHINE CONSTRUCTION

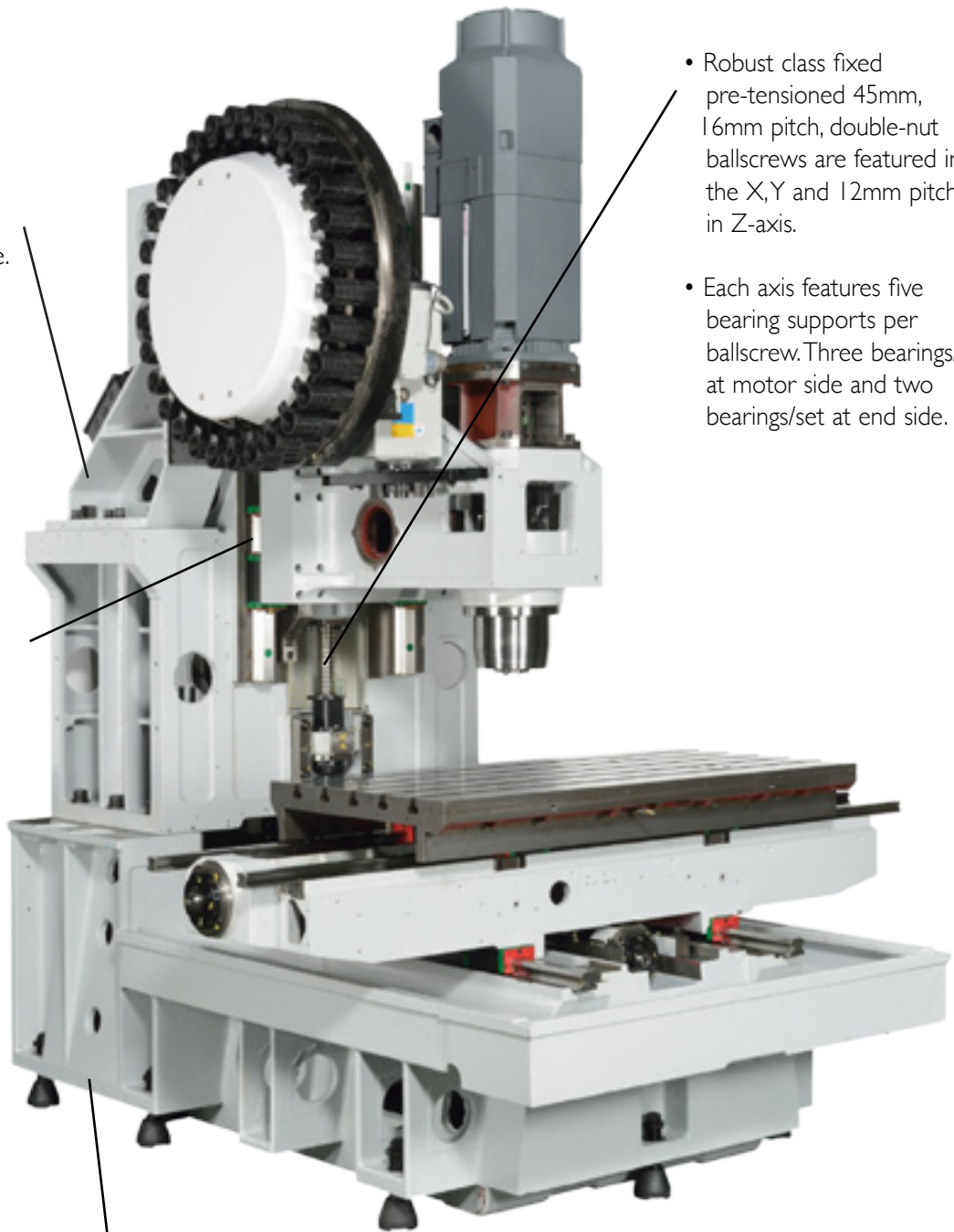
## VI000

The ATC mount is designed to properly support the ATC's weight by putting the force directly into the column for superior stability, rigidity and minimized vibration to the cutting zone.

- The Z & Y-axis utilizes 45mm ball-guides. The Z-axis features three trucks per guideway and the Y-axis, two trucks per guideway. The X-axis features two 35mm ball-guides with two trucks per guideway.

- This heavy duty guideway system ensures a very stiff, rigid and durable machine providing years of low maintenance, high accuracy and superior surface finishes.

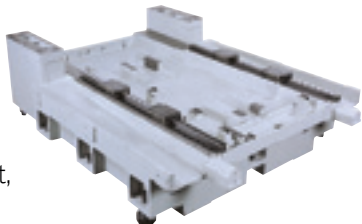
- Robust class fixed pre-tensioned 45mm, 16mm pitch, double-nut ballscrews are featured in the X,Y and 12mm pitch in Z-axis.
- Each axis features five bearing supports per ballscrew. Three bearings/set at motor side and two bearings/set at end side.



- Robust "C- frame" fixed column design from the popular XR machine family.
- Strategically ribbed base, column, and spindle carrier for increased rigidity and stiffness during demanding machining applications.
- For improved overall stiffness and rigidity, there are 17 hand scraped locations of column and base joint.

### Heavy duty linear guideways, ballscrews and axis drives

Wide-spaced, oversized linear guideways provide optimum stiffness with less friction, less heat and less thermal growth for faster traverse rates, longer machine life and greater positioning accuracy. The linear way modules consist of slide members (guide trucks) and linear rails to provide a large load rating, stable accuracy, high rigidity and low friction. The wide spacing between all axes rails provides optimum stiffness for the overall machine structure. The machine features double-nut, pre-stretched, largest-in-class ball screws for optimal rigidity.



### Large capacity, fast performance automatic tool changers

The Bridgeport VI000 has a fast tool change time of 2.5 seconds (Tool-Tool). The design of random inverter drive bi-directional ATCs and cam type mechanism features accurate, rapid and stable tool change system. 90 degree tool pocket prevents tool dropping. To ensure smooth and vibration-free tool changing, the tool changer is strategically located for minimal transfer of vibration—a unique design feature. The ATC also features random-access, bi-directional indexing.



### Advanced digital control to unleash your productivity

The VI000 machines features the latest Mitsubishi Control and comes standard with NAVI-MILL Conversational Programming. This control offers the latest hardware and software technology, providing an operator-friendly, easy to use system. Many standard features are included that other machine tool builders charge extra for such as rigid tapping, tool life management, run time and parts counter to name a few.



### BIG-PLUS® dual contact spindle system

BIG-PLUS® dual contact spindle that provides a stiffer interface between the spindle and the tool holder along with minimum run out on extended tools and better overall repeatability.

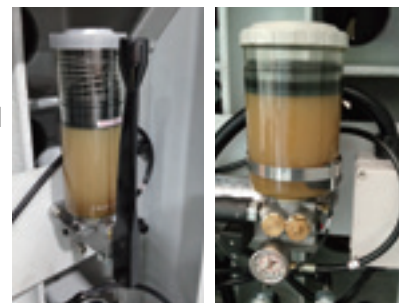


### Big Tool Function:

On machining centers utilizing a random bi-directional tool chain for tool storage when oversize tools are required for a specific application this function allows the user to turn off tool storage in adjacent pockets allowing the oversize tools to be loaded into the tool chain without interference from adjacent tool pots. On the VI000 users are permitted to run up to four oversize tools. M codes are used to allow tool pocket numbers 10, 12, 14 and 16 to become available for oversize tools by disallowing any tools to reside in pockets 9, 11, 13, 15 and 17.

### Machine lubrication

The Bridgeport VI000 utilizes Manual Centralized Grease Lubrication for all ballscrews and linear guides for extended component life. Optional Auto Grease Lubrication is also available.



Manual lubrication unit      Auto lubrication unit  
optional

### Elimination of Z-axis movement – A benefit of BIG-PLUS®

At high rotational spindle speeds, the mouth of the machine spindle can expand slightly due to centrifugal force. As the machine spindle expands, the conventional toolholder, which under constant draw bar pulling pressure, moves further into the spindle. On high tolerance applications, this slight pull back of the cutter can affect dimensional accuracy of the Z-axis. Pull back can also cause the toolholder to get locked into the machine spindle taper. The face contact provided by the BIG-PLUS® Spindle System prevents the toolholder from being drawn back into the machine spindle.

### Hardinge rotary solutions – optional

Hardinge Rotary Systems can easily be integrated into the Bridgeport VI000 increasing the machine's capabilities tremendously. Refer to brochure 2372 for a complete rotary product offering with dimensions and specifications.



# SPECIFICATIONS

## VI000

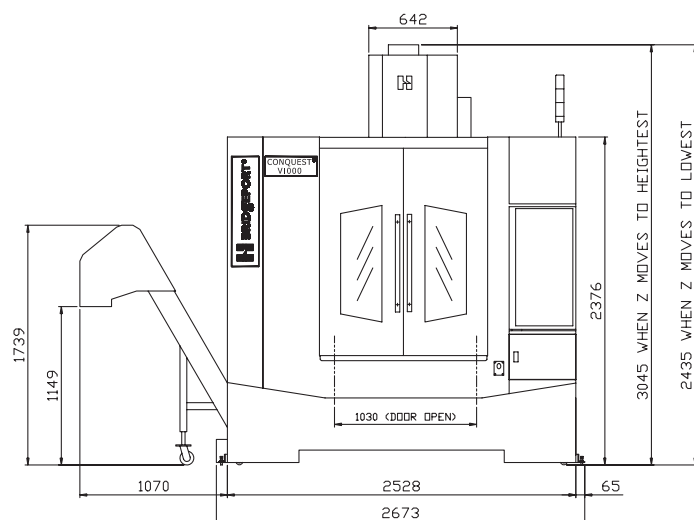
Positioning	
Auto Mode (X and Y axes)	1,692 in./min.
Auto Mode (Z axis)	1,417 in./min.
Manual Mode	0-354 in./min.
Ball Screw Diameter and Pitch (X,Y)	1.77" x 0.6299"
Ball Screw Diameter and Pitch (Z)	1.77" x 0.4724"
Axes Thrust X,Y,Z	939 / 939 / 2580 ft-lbs
Accuracy ISO 230-2	
Positioning	+/- 0.0004 in. (+/- 0.01 mm)
Repeatability	+/- 0.0002 in. (+/- 0.005 mm)
Spindle	
Spindle type	Direct Drive
Spindle Speed Range	10,000 rpm
Spindle Motor HP Rating Mitsubishi	20 / 25 / 29.5 hp
Spindle Torque 10,000 RPM	110.6 ft/lbs (148 Nm)
Retention Force	1,984 ft-lbs. (2689 Nm)
Tool Holder	CT40 or BT40
Distance from table surface to spindle gauge plane	3.9"-27.95" (min.-max.)
Worktable	
Working surface	47.2 in X 23.6 in. (1200 x 600mm)
Table load	2000lbs. (900 kg)
Number of T-Slots	5
T-Slot Size	.708" (18 mm)
Coolant	
Coolant tank capacity	105 US gallons (400L)
Flood Coolant	34 gal/min @ 21.33 psi
Automatic Tool Changer (ATC)	
Taper (ISO No.)	40
Type	Swing Arm
Tool Holder Type: BIG-PLUS®	BT or CAT or ANSI or DIN (SK)
Pull Stud Type	BT or BT modified BT for CAT & ANSI 2. DIN"
Tool Selection	Random Bi-directional
Tool Capacity	30
Maximum Tool Diameter (Full Drum)	3.15" (75mm)
Max. Tool Diameter (Adjacent Pockets Empty)	5.9" (150mm)
Maximum Tool Length	11.81" (300mm)
Maximum Tool Weight	15 lbs. (7 kg)
Tool Change Time (T-T)	2.5 sec
Tool Change Time (C-C) ISO 10791-9	4 sec
ATC Transmission	encoder feedback inverter drive ATC motor/cam

Axes Drives	
X axes servo motor	4hp (3.0Kw; A51/3000 rpm)
Y axes servo motor	4hp (3.0Kw; A51/3000 rpm)
Z axes servo motor with Brake	6hp (4.5Kw; A51/3500 rpm)
Travels	
X-Axis	40.16" (1020mm)
Y-Axis	24" (610mm)
Z-Axis	24" (610mm)
Gage Line Height (Min-Max)	3.9"-27.95" (100-710mm)
Y-Axis Throat Distance	24.72" (628mm)
Table	
X Length	47.2" (1200mm)
Y Width	23.6" (600mm)
Load Capacity	2000 lb (900kg)
T-Slots (# & size)	5 x .708" (18mm) x 3.94" (100mm)
Spindle Transmission	
Taper ISO No.	BIG PLUS® No. 40
Transmission	DDS
Max. Spindle Speed (rpm)	10000 (STD) / 12000 (OPT)
Main Motor HP Continuous/Duty rated	SJ-VKS30-16ZT-S03(F) 12000rpm 11/15 kw, 15/18.5 kw (cont. 30min)
Maximum Torque at Base Speed (1400rpm)	55.32/75.23/110.63 ft-lbs. (75/102/150 Nm) (cont./30min/10min)
Lubrication 10000 rpm	Permanently lubricated spindle
Spindle Bearing Protection	Air purge
Tapping Speed (max. rpm)	3000rpm
Spindle taper cleaning	Air blast
Draw Bar	
Actuation	Pneumatic
Clamp force	1,984- ft-lbs./ 8820 N
Clamp method	Disk springs
Ball Screws	
Ball Screw Size/Support	Fixed pre-tensioned
X-Axis	1.77" (45mm)
Y-Axis	1.77" (45mm)
Z-Axis	1.77" (45mm)
Double Nut (Ball Nut)	STD
Lubrication	Manual central lubrication option: auto grease lube
Ball Screw Pitch	X/Y: 0.63" (16mm) Z: 0.47" (12mm)

Linear Guideway	
Type	Ball Guide
Way Size(X/Y/Z)	35mm/45mm/45mm
Linear Ways X-Axis	2
Linear Ways Y-Axis	2
Linear Ways Z-Axis	2
Linear Guide Trucks X-Axis	4
Linear Guide Trucks Y-Axis	4
Linear Guide Trucks Z-Axis	6
Lubrication	Manual central lubrication option: auto grease lube
X,Y, and Z-Axis Rapid Traverse Rate	X/Y: 43m/min(1692 i), Z: 36m/min(1417i)
Max.programmable feed rates (all axes)	630 in./min (16m/min)
General Specifications	
Machine Weight	15,400lbs/7000kg
Machine Overall Width	105" (2673mm) Chip conveyor not included
Machine Overall Height	120" (3048mm)
Machine Overall Depth	112" (2850mm)
Front Door opening	40" (1030mm)
Window material	Laminated panel (Lexan/Glass)
Coolant Tank Capacity (Liters)	105 GAL /400L
Coolant Flow Rate for Cutter (L/min)	MTH4-30/2, 34 gal/min (130L/min), 1.5kg/cm <sup>2</sup> (60HZ) / MTH4-30/3, 34 gal/min (130L/min), 1kg/cm <sup>2</sup> (50HZ)
Minimum Air Requirements	80 PSI (5.5 kg/cm <sup>2</sup> )
Power Requirements	
(FLA/VOLTS/PHASE)	79 amp / 220 volt / 3 phase, KVA =36

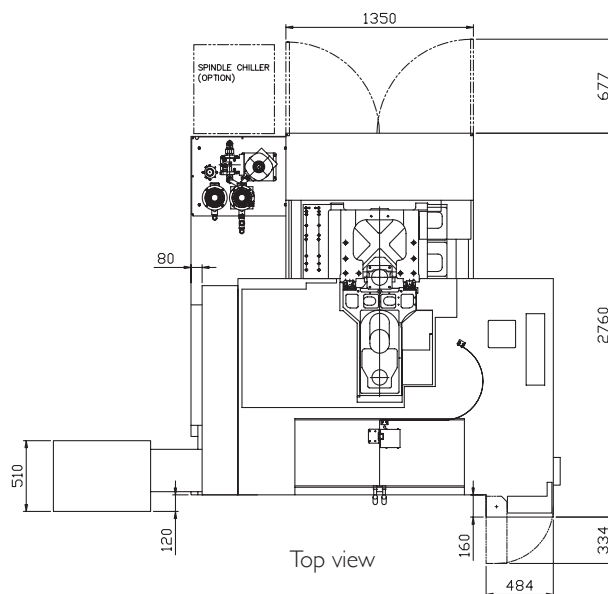


## VI000 Floor Plan



Front view

\* Chip conveyor may be placed on the left or right of machine



Top view

# STANDARD CONTROL V-SERIES MACHINES



## General Overview

- Mitsubishi M70 Type A Control
  - 10.4" Color LCD Display with Full Keyboard
  - Inch/Metric Data Selection by G-Code
  - 1280 Meters Part Program Storage
  - Part Program Storage USB or Compact Flash
  - Data Input/output - USB or Compact Flash
  - MDI (Manual Data Input) Operation
  - Reader/Punch Interface RS232
  - Compact Flash Card
  - Ethernet interface (Data Transfer Capability)

### Programming Functions

- Absolute/Incremental Programming
- Custom Macro Variables 700 sets
- Max work piece coordinate (54 sets)
- Auto Coordinate System Setting
- Auto corner override
- Background Editing
- Fixed Cycles
- NAVI-MILL Conversational Programming
- Buffer correction
- Corner chamfering / Corner R
- Constant Surface Speed Programming
- Thread Cutting
- Coordinate System Setting (G50)
- Coordinate rotation By G program (G68/G69)
- Custom Macro
- Decimal Point Programming
- Input of Offset Value by Programming (G10)
- Interpolation (Linear and Circular)
- Scaling (G50/G51)
- Program Number Search
- Reference Point Return
- Registered Part Programs (1,000 programs)
- Pocketing /tapping cycle
  - Deep-Hole tapping cycle
- Rigid Tapping
- Sequence Number Search
- Single Block Operation
- Stored Stroke Check
- Thread Cutting
- Tool Life Management
- Tool radius compensation
- Tool length compensation
- Helical Interpolation
- Cylindrical Interpolation
- Spiral/ Conical Interpolation
- Polar coordinate command

### Programming Functions (cont'd)

- Max tool compensation 400 sets
- High-accuracy Control ; G61.1, G08
- High-speed Machining & High-accuracy Control mode I ; G05.1 Q1/Q0
- High-speed Machining & High-accuracy Control mode II ; G05P10000/P0
- Simple SSS (Super Smooth Surface) Control
- Spline ; G05.1 Q2 X 0/Y0/Z0, Q0
- High-accuracy Spline Interpolation ; G61.2
- Max block Pre-read buffer 337
- Work-piece position measurement (surface/hole width/rotation)
- Manual speed command

### Operation

- Block Delete
- Dry Run
- Dwell Time
- Emergency Stop
- Feed Hold
- Feed rate Override (0 to 150%)
- Jog Feed
- Machine Lock
- On Screen Spindle Load Monitoring
- Option Stop
- Rapid Traverse Override (Low-25-50-100%)
- Tool Geometry and Tool Wear Offsets (80 pairs each)
- Flash card (PCMCIA) capability
- Manual speed command

### Miscellaneous

- Actual Cutting Speed Display
- Alarm Display
- Clock Function
- French, German, Italian or Spanish

### Miscellaneous (cont'd)

- Ladder Diagram Display
- Mechanical Run Meter
- On-Screen "HELP" Functions for Alarms
- Spindle Orient
- Run Time and Parts Counter
- Self-Diagnosis Function
- Menu List
- Operation & G Code Guidance
- Alarm & Parameter Guidance
- Program restart easily after power failure or broken tools occurred.
- 3D solid graphic and program check
- 2D graphic check and trace
  - Big tool management (6 tools)
  - NC data backup (auto /manual)
- Vertical axis drop prevent while power turned down
- NC explore (Data transfer tool)

### Optional functions

- Option block skip addition
- Manual interruption
- Automatic operation Handle interruption
- Manual absolute switch
- Tapping retract
- Arbitrary reverse run
- Reference position retract
- Machining condition selection I (1 St. part system only)
- Manual tool length measurement I
- Multi-step skip
- Advance SSS (Super Smooth Surface) Control (Requires a hardware kit)
- Extend Part Program Storage to 2M (Requires a hardware kit)



**FANUC**

## General Overview

- Fanuc 0iMD Control
  - 8.4" Color LCD
  - Manual Guide Oi
  - Dynamic Graphic Display
  - Max controlled axes: 5
  - 4 axis simultaneously
  - Minimum Programmable Res. - 0.0001" (0.001 mm)
  - MDI
  - Servo control HRV3
  - Backlash compensation
  - Linear interpolation
  - Coordinate system rotation
  - Helical interpolation
  - Polar coordinate command
  - Circular interpolation (Multi-quadrant is possible)
  - Cylindrical interpolation
  - Workpiece coordinate system
  - Mirror image
  - Automatic acceleration /deceleration
  - Tool offset pairs,  $\pm 6$  digits, 400 pairs
  - Tool length compensation
  - Tool offset memory C
  - Tool Radius compensation
  - Part program storage length 1280 m / 512 Kbyte
  - Number of registerable programs 400
  - Self-diagnosis function
  - Operation history display
  - Help function
  - Stored pitch error compensation
  - Tool life management
  - Workpiece coordinate system, G52 - G59
  - Addition of workpiece coordinate system 48 pairs
  - Automatic tool length measurement
  - AI advance preview control - AiAPC
  - Display unit with PCMICA interface
  - Rigid tapping
  - USB Port
  - Skip G31 High-Speed Skip Input
  - Nano interpolation
  - Embedded Ethernet

## HARDINGE COMPANIES WORLDWIDE

Over the years, The Hardinge Group™ steadily diversified both its product offerings and operations. Today, the company has grown into a globally diversified player with manufacturing operations in North America, Europe and Asia. In addition to designing and building turning centers, and collets, Hardinge is a world leader in grinding solutions with the addition of the Kellenberger, Jones & Shipman, Hauser, Tschudin, Usach and Voumard brands to the Hardinge family. The company also designs and manufactures Bridgeport machining centers and other industrial products for a wide range of material cutting, turnkey automation and workholding needs.

Expect more from your Hardinge products. Choose Hardinge precision and reliability for increased productivity and value!

Call us today, we've got your answer.



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