

# BRIDGEPORT V-SERIES

VERTICAL MACHINING CENTERS

V480

V710

V1000



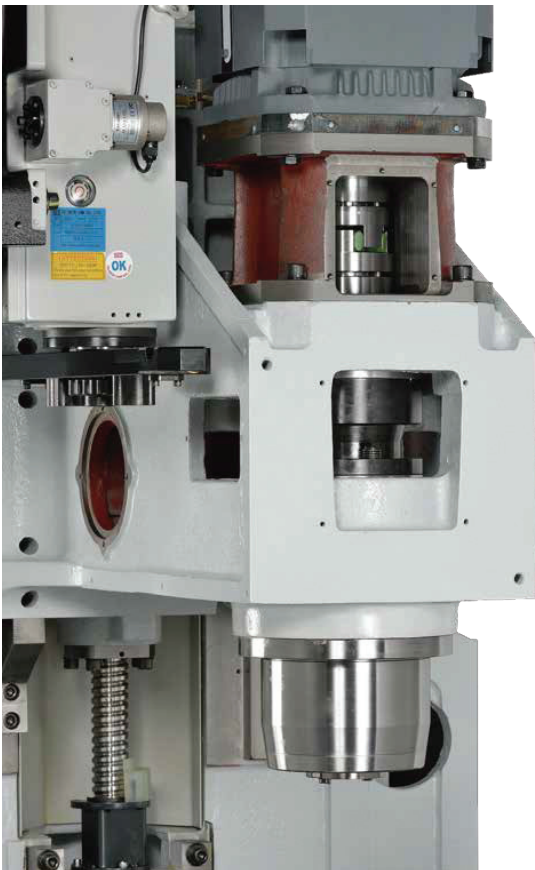
***Bridgeport***<sup>®</sup>

# BRIDGEPORT V-SERIES

## VERTICAL MACHINING CENTERS

### PRECISION SPINDLE

- Dual contact, 40 taper, 10,000-rpm grease lubricated spindle powered by a direct drive, Fanuc spindle motor.
- Optional 12,000-rpm / 15,000-rpm Oil-Air Spindle.
- High tool retention for aggressive cutting applications. (900kgf / 8,820N)



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.



# VERTICAL MACHINING CENTER

## HIGH RIGIDITY STRUCTURE

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 (3) trucks per guideway and the Y-axis, (2) trucks per guideway. The X-axis features (2) 35mm ball-guides with (2) 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.

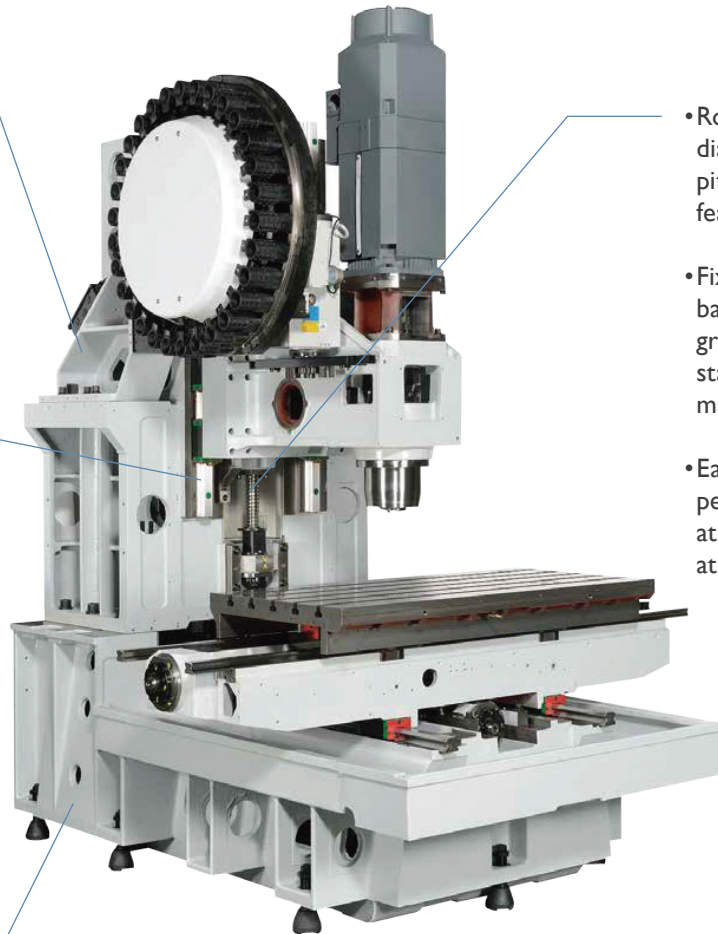
• Robust "C-frame" fixed column design from the popular XR machine family.

• Strategically ribbed base, column, and spindle carrier for increased rigidity and stiffness during demanding machining applications.

• Includes scraping of column & base joint for improved overall stiffness and rigidity.

## TOOL PROBE (OPTIONAL)

Automatic Renishaw Tool Probe, easy to use and define tool offset combined with macro programming. Reduce non-cutting cycle time and easily check tool length, diameter or wear.



• Robust class #3, 45mm diameter, 12mm or 16mm pitch, double-nut ballscrews are featured in the X, Y and Z-axis

• Fixed, pre-tensioned (0.04mm) ballscrews minimize thermal growth, enhance rigidity, stability, and precision of the machine.

• Each axis features (5) bearings per ballscrew. (3) bearings/set at motor side, (2) bearings/set at end side.

## MACHINE LUBRICATION

VI1000 utilizes Manual Centralized Grease Lubrication for all ballscrews and linear guides for extended component life. Optional Auto Grease Lubrication is also available.

### MACHINE LUBRICATION UNIT



### AUTOMATIC LUBRICATION (OPTION)



# HIGH PRECISION MACHINING

## HIGHER EFFICIENCY

Faster machining duty cycle time, lower non-cutting time.

- Spindle motor 3.7/5.5/9.0kW 15,000 rpm direct drive with Max. torque 28.7 Nm at base speed.
- Fanuc axial servo motor 1.6 kW on X, Y axes, 3kW on Z Axis.
- Rapid traverse feed, max. rapid and jog 48m/min.
- Max. rigid tapping speed 6,000 rpm.
- Acceleration reaches 1.0G on X, Y Axes and 0.8G on Z Axis.



## RIGID STRUCTURE

Longer tool life and higher heavy cutting ability

- FEA (Finite Element Analysis) techniques were used to design and build a rigid, structurally-balanced machine to assure optimum rigidity and life.
- Two linear guideways on X Axis and two guide trucks per guideway. The Y and Z Axes feature two linear guideways with two heavy-duty guide trucks, per guideway,
- Ground ballscrew features low noise, low thermal growth and heavy-duty transmission.
- Low inertia coupling connect between ballscrews and axial servo motor directly.
- Rigid, C-frame fixed column design. Spindle carrier, column and base are manufactured from high-quality cast iron, contributing to overall rigidity and machining capabilities.

## BRIDGEPORT DESIGNED AND BUILT A COMPLETE RANGE OF V-SERIES TO SUIT VARIOUS MACHINING REQUIREMENTS

### V480/V710 (#30) MACHINING CAPABILITY (MAX SPINDLE SPEED: 15,000 RPM)

MACHINING	DRILLING		TAPPING		MACHINING	FACING
Part Material	S45C	ADC12	S45C	ADC12	Part Material	S45C
Tool	Ø16 HSS	Ø30 HSS	M16xP2.0	M24xP3.0	Tool Diameter (mm)	Ø40 (4 Inserts)
Spindle Speed (rpm)	500	930	300	220	Spindle Speed (rpm)	3,000
Feed Rate (mm/min)	90	232	600	660	Cutting Amount (cm <sup>3</sup> /min)*	72: 30x4x600

### V480/V710 (#40) MACHINING CAPABILITY (MAX SPINDLE SPEED: 10,000 RPM)

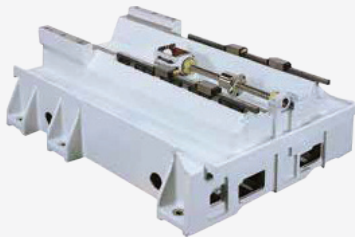
MACHINING	DRILLING		TAPPING		MACHINING	FACING
Part Material	S45C	ADC12	S45C	ADC12	Part Material	S45C
Tool	Ø24 HSS	Ø24 HSS	M20xP2.5	M30xP3.5	Tool Diameter (mm)	Ø80 (6 Inserts)
Spindle Speed (rpm)	330	740	400	200	Spindle Speed (rpm)	1,500
Feed Rate (mm/min)	66	222	1000	700	Cutting Amount (cm <sup>3</sup> /min)*	189: 60 x 3.5 x 900

# VERTICAL MACHINING CENTER

**RIGID STRUCTURE,  
SUPERIOR RELIABILITY**



**SA ATC TYPE V480 / V710**



**RIGID MACHINE BASE**

**EXCELLENT AND  
STABLE ACCURACY**

Stable static and cutting accuracy

- Accurate Positioning Accuracy  
ISO230-2: Full stroke positioning accuracy 0.01mm.
- Accurate Repeatability Accuracy  
ISO230-2: Full stroke repeatability accuracy 0.005mm.
- Ball-Bar contouring test and laser compensation for each machine to ensure geometric and cutting accuracy.
- Superior cutting capability



Chip Conveyor Option

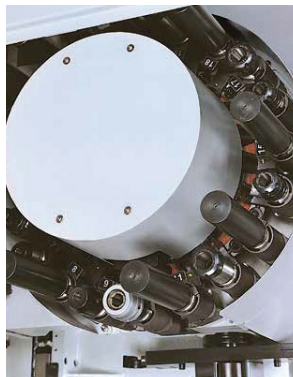


**COOLANT TANK**

**AUGER TYPE CHIP  
CONVEYOR (OPTIONAL)**

**COOLANT TANK AND MOTOR**

170 liter coolant tank capacity plus chip screens ensure good coolant flow. High-volume coolant chip flush system surround enclosure and auger type chip conveyor as optional allows chip evacuation on waycovers and enclosure into chip pans.



**SWING ARM ATC 20 TOOLS**

Rapid and stable tool change system operated by cam type mechanism, 90° tool pocket prevents tool dropping. Synchronized swing arm ATC features superior tool changing capability.

# CONTROLS



## FANUC 0iMF CONTROL FEATURES:

- 10.4" LCD Color Display
- Linear / Circular / Helical Interpolation
- Programmable Data Input
- PCMCIA Card Slot
- Workpiece Coordinate System
- Manual Pulse Generator (Handwheel)
- Coordinate System Rotation
- Rigid Tapping
- Tool Life Management
- Tool Length compensation
- Background Editing
- Ethernet Ready / RS232 Ready/ USB Slot
- Additional Workpiece
- Coordinate System
- Manual Guide i



## SIEMENS 828D CONTROL FEATURES:

- 10.4" Color Display
- RJ45 Ethernet Port / Network Drive
- USB 2.0
- Compact Flash (CF) interface
- Intuitive Jog Mode
- Tool and Workpiece Measurement
- Intuitive & Transparent Tool Management
- Graphical Interactive Programming & Operation
- Mold Making Quick Viewer
- Transformation - Cycle800
- MDynamics - Mold & Die
- Technology Package



## HEIDENHAIN TNC 620 CONTROL FEATURES: \*

\* *Heidenhain TNC 620 Control is only available on VI000*

- Contour Approach and Departure
- FK Free Contour Programming
- Program Jumps
- Fixed Cycles
- Coordinate Transformations
- Q Parameters
- Programming Aids
- Actual Position Capture
- Verification Graphics
- Program Run Graphics
- Machining Time
- Returning to the Contour
- Datum Tables
- Preset Table
- Data Interfaces
- Tool Compensation
- Cutting Data Tables
- Constant Contouring Speed
- Parallel Operation

*Conversational programming features offered on the CNC control is the CNC control builder's standard product, which may not fully support all machine functions. It is recommended the end user reference the control system documentation, or contact the control manufacturer, for further details of use or customization.*

# VERTICAL MACHINING CENTER V1000

## ATC TOOL MAGAZINE WITH INVERTER

Taper (ISO No.): 40

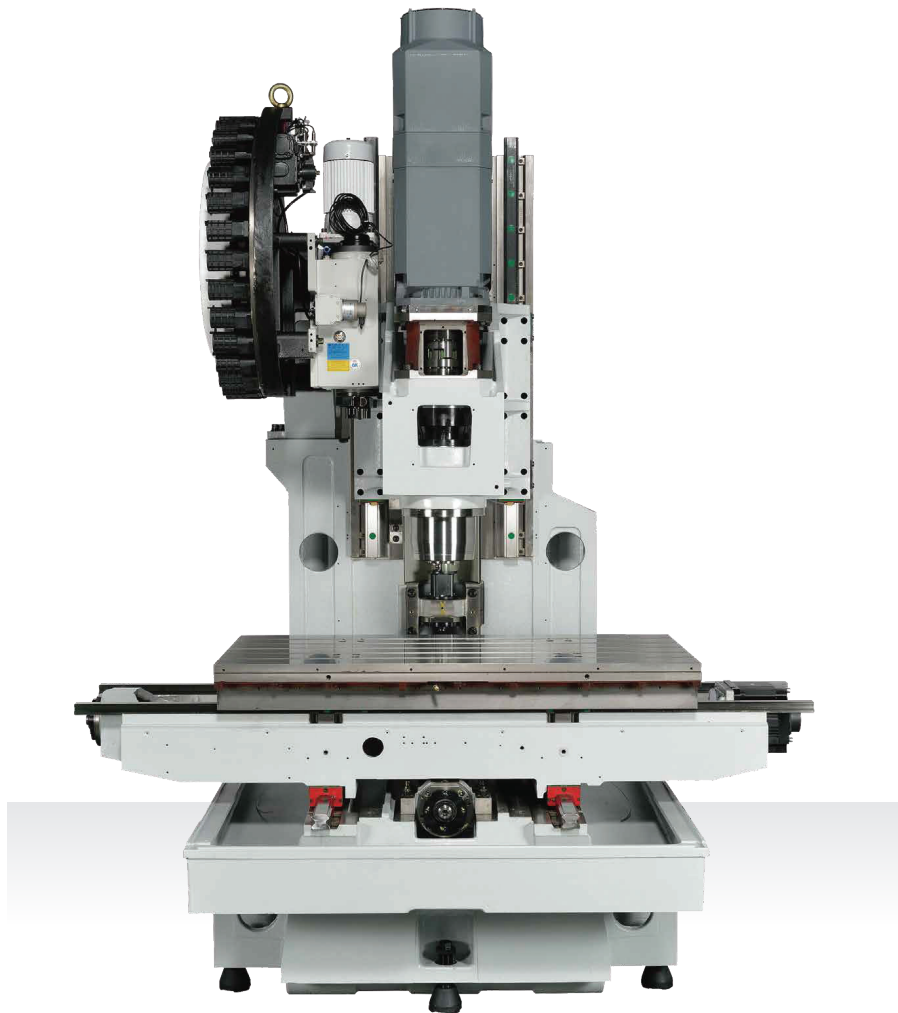
Tool Holder Type: BT or CAT or ANSI  
or DIN (SK)

## PULL STUD TYPE:

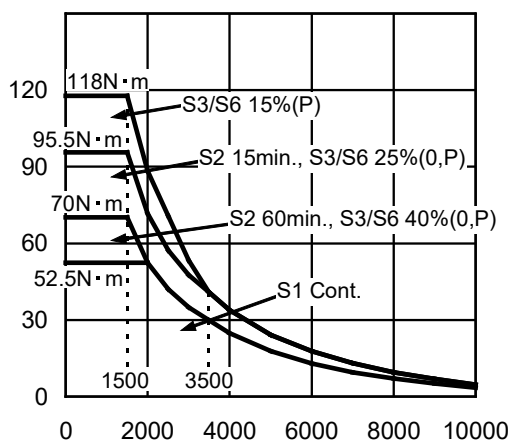
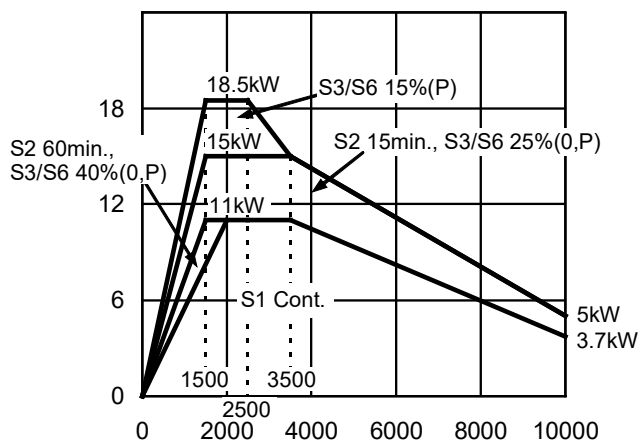
1. BT or modified BT for CAT & ANSI
2. DIN
- Tool Capacity: 30
- Maximum Tool Diameter (Full Drum): 75 mm
- Max. Tool Diameter  
(Adj. Pockets Empty): 150mm
- Maximum Tool Length: 300 mm
- Maximum Tool Weight: 7 Kg
- Tool Change Time ( T-T ): 1.5 Sec

## THERE ARE 5 FEATURES WITH THE INVERTER TYPE CAM BOX:

1. Higher speed tool change.
2. Decelerate: Swing arm decelerates before it hits the tool.
3. Support bigger dia. tool and heavy tool change.
4. Arm C.W. and C.C.W. jog operation.
5. Auto recovery.



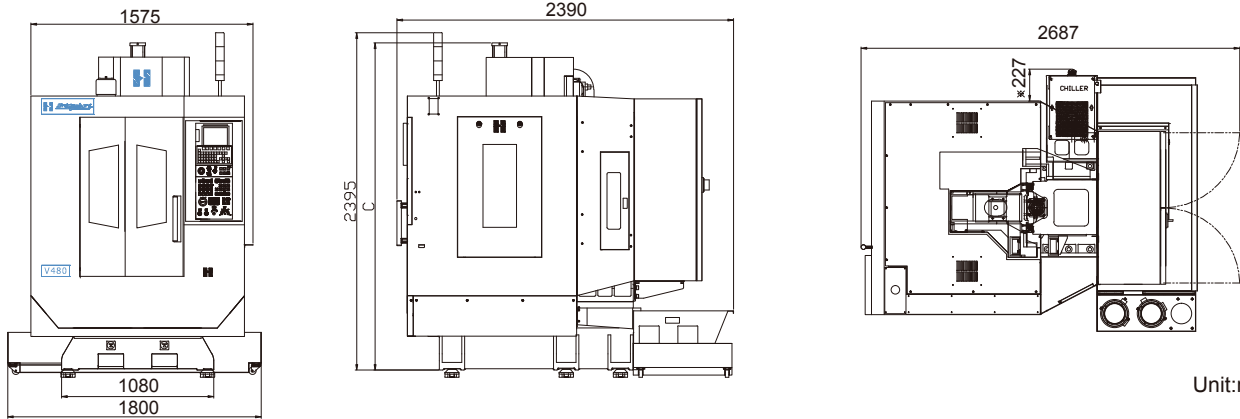
## FANUC SPINDLE MOTOR: 10,000RPM POWER & TORQUE CHARACTERISTIC CURVE:



Fanuc BiT12 / 12000rpm Spindle Motor  
(Speed Limit 10,000rpm)

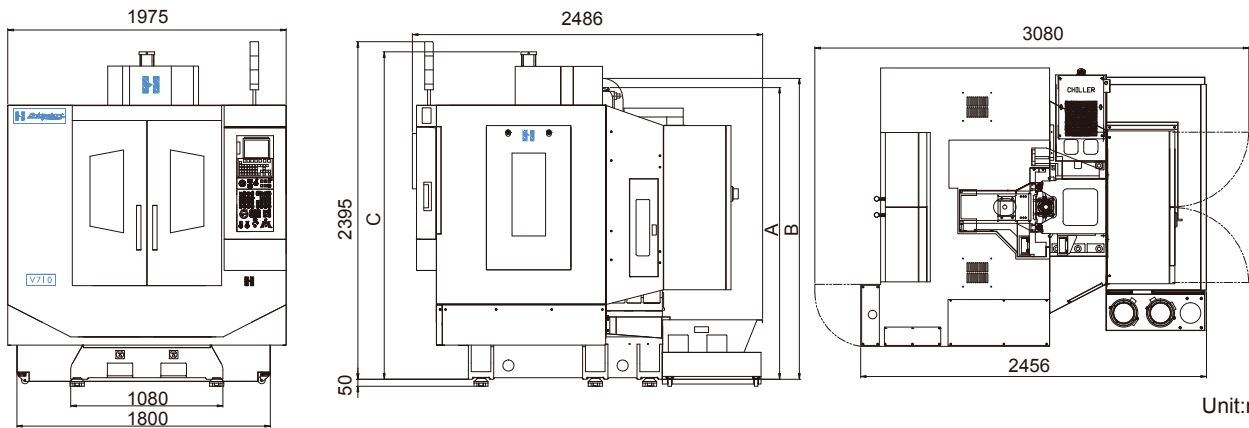
# FLOOR PLANS

## V480



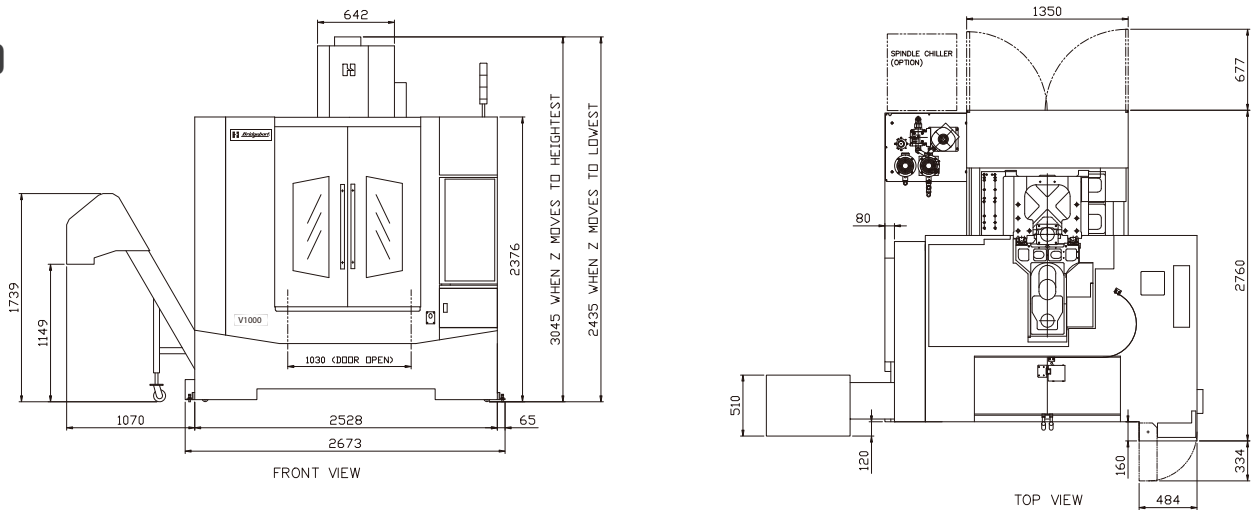
Unit:mm

## V710



Unit:mm

## V1000





# MACHINE SPECIFICATIONS V480 / V710

Size	V480 STANDARD			V710 STANDARD		
	V480 (#40)		V480 (#30)	V710 (#40)		V710 (#30)
	Spindle Type: DDS	Spindle Type: Belt		Spindle Type: DDS	Spindle Type: Belt	
A	2047	2047	2071	2047	2047	2071
B	2136	2136	2310	2136	2136	2310
C	1892~2322 2144~2572 (CTS)	1793~2223 1893~2323 (CTS)	1692~2122 (Fanuc) 1726~2156 (Siemens) 1885~2315 (Fanuc CTS)	1892~2322 2144~2572 (CTS)	1793~2223 1893~2323 (CTS)	1692~2122 (Fanuc) 1726~2156 (Siemens) 1885~2315 (Fanuc CTS)
TYPE	V480 (#40)		V480 (#30)	V710 (#40)		V710 (#30)
Weight	3,800 kg		3,800 kg	3,907 kg		3,907 kg

## MACHINE CONFIGURATIONS V480

	V480 (#40 Taper)	V480 (#30 Taper)	Unit
<b>TRAVEL</b>			
Carousel Type (X x Y x Z)	480 x 400 x 430	N/A	mm
SA ATC (X x Y x Z)	480 x 400 x 430		mm
Spindle Nose to Table Surface	150 - 580 (SA ATC & Carousel)	150 - 580 (SA ATC)	mm
Table Front End to Door	150		mm
Spindle Center to Column	429	420	mm
<b>TABLE</b>			
Table Dimension	600 x 400		mm
Weight on Table (Max.)	300		kg
T-Slots (Width x No. x Pitch)	14 mm x 3 x 125 mm		
<b>SPINDLE</b>			
Motor Rating (Max.)	10 hp / 7.5 kW (S3 25%)	12 hp / 9.0 kW (S3 25%)	
Speed (Max.)	10,000 Belt Drive	15,000 Direct Drive	rpm
Torque (Max.)	47.7	28.7	N-m
Tapping Speed (Max.)	3,000	6,000	rpm
<b>BALL SCREW</b>			
Diameter	32		
<b>FEED RATES (ALL AXES)</b>			
Rapid and Traverse Rate	36	48	m/min
Cutting Feed Rate (Max.)	12	15	m/min.
<b>TOOL CHANGER</b>			
Tool Capacity	16 (Carousel - Standard) 20 (Swing Arm - Option)	20 Swing Arm	
Tool Selection	Bi-Directional		
Tool Holder Type	BT or CAT or SK or ANSI 40	BT or CAT or SK or ANSI 30	
Tool Diameter Max. (Carousel Type)	94 (Full), 130 (Adj. Pockets Empty)	N/A	mm
Tool Diameter Max. (SA ATC Type)	75 (full) 150 (Adj empty)		mm
Tool Length Max. (SA ATC Type)	185		mm
Tool Weight Max. (Carousel Type)	6	N/A	kg
Tool Weight Max. (SA ATC Type)	7	4	kg
Tool Change Time (Avg.) (Carousel Type)	5.5 (C-C 7.5)	N/A	sec
Tool Change Time (Avg.) (SA ATC Type)	2 (C-C 4)	0.8 (C-C 2.2)	sec

	V480 (#40 Taper)	V480 (#30 Taper)	Unit
<b>ACCURACY (ISO 230-2)</b>			
Positioning (All Axes)	0.010		mm
Repeatability	0.005		mm
<b>MOTORS</b>			
Axis Motor Rating	1.8	1.6 (X, Y) / 3 (Z)	kW
Coolant & Flush Motor	0.52		kW
<b>LUBRICATION</b>			
Spindle Bearing	Grease		
Linear Guideways	Grease		
Ball Screw	Grease		
<b>COOLANT CAPABILITY</b>			
Coolant Tank Capacity	170		liter
Chip Flush Rate	40		liter
<b>MISCELLANEOUS</b>			
Compressed Air Reg. (Min.)	70 psi, 5 kg / cm <sup>2</sup>		
Power Supply Requirement	52A FLA / 220V / 3 Phase		
<b>OPTIONAL</b>			
Coolant Through Spindle 280 psi (20 Bar)			
Chip Flush System			
4th Axis Rotary Tables			
Chip Wash Down Hose			
Siemens 828D Controller			
10K RPM Direct Drive Spindle (#40)			
12K RPM Direct Drive Spindle (#40)			
15K RPM Direct Drive Spindle (#40)			
20K RPM Direct Drive Spindle (#30)			
24K RPM Direct Drive Spindle (#30)			
Chip Conveyor	Auger Type	Hinge Type	Scraper Type
Z Axis Column Rasier 200 mm			
Tool Probe / Pre-Wiring			
Part Probe / Pre-Wiring			
Fast Ethernet Interface + D/ S 2GB Memory Card			
AICCII (Pre-read 200 Blocks)			

To keep improvements and developing new functions, Hardinge Taiwan reserves the rights to change specifications without further notice. Due to varying cutting conditions, actual results may be greater or less than those listed

# MACHINE SPECIFICATIONS V710

	V710 (#40 Taper)	V710 (#30 Taper)	Unit
<b>TRAVEL</b>			
Carousel Type (X x Y x Z)	710 x 400 x 430	N/A	mm
SA ATC (X x Y x Z)	710 x 400 x 430		mm
Spindle Nose to Table Surface	150 - 580 (SA ATC & Carousel)	150 - 580 (SA ATC)	mm
Table Front End to Door	150		mm
Spindle Center to Column	429	420	mm
<b>TABLE</b>			
Table Dimension	800 x 400		mm
Weight on Table (Max.)	300		kg
T-Slots (Width x No. x Pitch)	14 mm x 3 x 125 mm		
<b>SPINDLE</b>			
Motor Rating (Max.)	10 hp / 7.5 kW (S3 25%)	12hp/ 9kW (S3 25%)	
Speed (Max.)	10,000 Belt Drive	15,000 Direct Drive	rpm
Torque (Max.)	47.7	28.7	N-m
Tapping Speed (Max.)	3,000	6,000	rpm
<b>BALL SCREW</b>			
Diameter	32		
<b>FEED RATES (ALL AXES)</b>			
Rapid and Traverse Rate	36	48	m/min
Cutting Feed Rate (Max.)	12	15	m/min.
<b>TOOL CHANGER</b>			
Tool Capacity	16 (Carousel - Standard) 20 (Swing Arm - Option)	20 Swing Arm	
Tool Selection	Bi-Directional		
Tool Holder Type	BT or CAT or SK or ANSI 40	BT or CAT or SK or ANSI 30	
Tool Diameter Max. (Carousel Type)	94 (Full), 130 (Adj. Pockets Empty)	N/A	mm
Tool Diameter Max. (SA ATC Type)	75 (full) 150 (Adj empty)		mm
Tool Length Max. (Carousel Type)	250	N/A	mm
Tool Length Max. (SA ATC Type)	185		mm
Tool Weight Max. (Carousel Type)	6	N/A	kg
Tool Weight Max. (SA ATC Type)	7	4	kg
Tool Change Time (Avg.) (Carousel Type)	5.5 (C-C 7.5)	N/A	sec
Tool Change Time (Avg.) (SA ATC Type)	2 (C-C 4)	0.8 (C-C 2.2)	sec

	V710 (#40 Taper)	V710 (#30 Taper)	Unit
<b>ACCURACY (ISO 230-2)</b>			
Positioning (All Axes)	0.010		mm
Repeatability	0.005		mm
<b>MOTORS</b>			
Axis Motor Rating	1.8	1.6 (X, Y) / 3 (Z)	kW
Coolant & Flush Motor	0.52		kW
<b>LUBRICATION</b>			
Spindle Bearing	Grease		
Linear Guideways	Grease		
Ball Screw	Grease		
<b>COOLANT CAPABILITY</b>			
Coolant Tank Capacity	170		liter
Chip Flush Rate	40		liter/min
<b>MISCELLANEOUS</b>			
Compressed Air Reg. (Min.)	70 psi, 5 kg / cm <sup>2</sup>		
Power Supply Requirement	52 FLA / 220V / 3 Phase		
<b>OPTIONAL</b>			
Coolant Through Spindle 280 psi (20 Bar)			
Chip Flush System			
4th Axis Rotary Tables			
Chip Wash Down Hose			
Siemens 828D Controller			
10K RPM Direct Drive Spindle (#40)			
12K RPM Direct Drive Spindle (#40)			
15K RPM Direct Drive Spindle (#40)			
20K RPM Direct Drive Spindle (#30)			
24K RPM Direct Drive Spindle (#30)			
Chip Conveyor	Auger Type	Hinge Type	Scraper Type
Z Axis Column Rasier 200 mm			
Tool Probe / Pre-Wiring			
Part Probe / Pre-Wiring			
Fast Ethernet Interface + D/ S 2GB Memory Card			
AICCI (Pre-read 200 Blocks)			

To keep improvements and developing new functions, Hardinge Taiwan reserves the rights to change specifications without further notice. Due to varying cutting conditions, actual results may be greater or less than those listed

# MACHINE SPECIFICATIONS V1000

Unit: mm

<b>TRAVEL</b>	
X/Y/Z Axes	1020 x 610 x 610
Spindle Nose to Table	100 - 710
Y-Throat Distance	628
<b>TABLE</b>	
Table Size	1200 x 600
Load Capacity	900 Kg
Distance from Floor to Table Surface	861
<b>SPINDLE</b>	
Taper	BBT 40
Transmission	DDS
Spindle Speed (rpm)	STD: 10,000 (Grease) OPT: 12,000 (Oil-Air)
Motor Power	11 kW/ 15kW (Cont./ S3-25%) (Fanuc) 10 kW/ 17kW (S1/ S6-25%) (Heidenhain) 14.6kW/17.5kW (Cont./ S6-60%) (Siemens)
Maximum Torque at Base Speed	52.5 N-m/ 95N-m (Cont./ 30min) (Fanuc) 63.7N-m/ 108.6N-m (S1/ S6-25%) (Heidenhain) 42N-m/ 112N-m (Cont./ S6-60%) (Siemens)
<b>AXES DRIVES (X/Y/Z SERVO MOTORS)</b>	
Fanuc	3kW/ 3kW/ 4kW
Heidenhain	4.5kW/ 4.5kW/ 5.1kW
Siemens	3.1kW/ 3.1kW/ 4.9kW
<b>BALL SCREWS (X/Y/Z AXES)</b>	
Size	45 / 45 / 45
Pitch	X/Y : 16, Z : 12
Lubrication	Grease Central Lubrication
<b>LINEAR GUIDEWAYS (X/Y/Z AXES)</b>	
Type	Ball Guide
Size	35 / 45 / 45
Linear Ways	2 / 2 / 2
Linear Guide Trucks	4 / 4 / 6
Lubrication	Grease Central Lubrication
Rapid Traverse Rate	X/Y: 43m/min, Z: 36m/min
<b>ACCURACY (X/Y/Z AXES)</b>	
Positioning	0.01 (With Scales : 0.005)
Repeatability	0.005 (With Scales : 0.004)
<b>GENERAL SPECIFICATION</b>	
Machine Overall Size (Width / Depth / Height)	2673 x 2760 x 2435~3045
Machine Weight	7000Kg
Front Door Opening	1030
Vision Window Material	Laminated
Coolant Tank Capacity	300
Air Requirement	5.5 kg/cm <sup>2</sup> minimum
Power Requirement	89 amp/ 220 volt/ 3 phase (Fanuc) 41 amp/ 400 volt/ 3 phase (Heidenhain) 51 amp/ 400 volt/ 3 phase (Siemens)

## STANDARD FEATURES

- Manual Central Grease Lubrication (X/Y/Z Axes)
- 4th Axis Pre-wiring
- Work Light
- Stack Light (3 colors)
- Retention Knobs
- Surround Tool Coolant (On Spindle)
- Spindle Taper Cleaner
- Remote MPG (Option for Heidenhain)
- Ethernet Connection
- Automatic Power Off
- External Spindle Surround Coolant
- Thermal Compensation (Heidenhain)

## OPTIONAL FEATURES

- 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 Scales (X/Y/Z Axes)
- Column Riser 150 mm
- Cutter Air Blast (Spindle side)
- Power Case Chiller