



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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MILLING

XR760 XR1000
High-Performance

Vertical Machining Center



※ To keep improvement 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.



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XR-Series High-Performance Vertical Machining Centers

As your needs grow, Bridgeport has solutions for increased capacity

Whether you're machining simple workpieces, quality molds and dies, or complex prismatic parts, we've got just the right Bridgeport XR-Series machining center for your operation. Bridgeport XR machines easily satisfy the most demanding production and precision component machining requirements in the aerospace, automotive, mold and tool making, power engineering and oil/gas

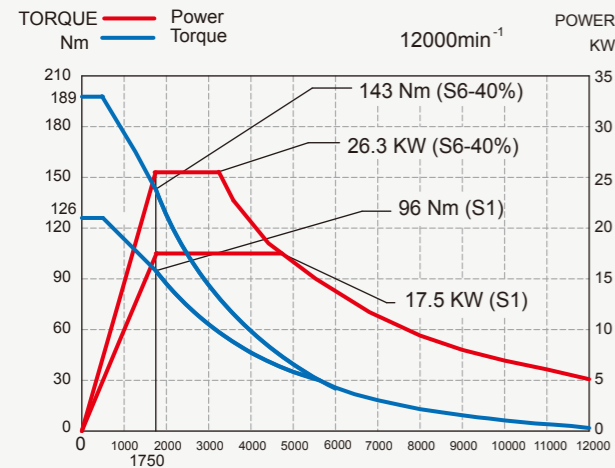
sectors to name a few. When a larger working cube is required, then the XR 760 is ideal. This model has the best Y-axis travel in the industry for a VMC in it's size. When more X-axis travel is needed, then the XR 1000 satisfies the requirement nicely. These robust machines offer exceptional stiffness and rigidity to deliver outstanding results in the most demanding production environments. They are particularly well suited to machine exotic metals, such as Titanium and Nimonics (nickel-based alloys). To further increase productivity, XR-Series VMCs are configured for 4-axis machining with an optional interface and rotary table.



XR 760
XR 1000

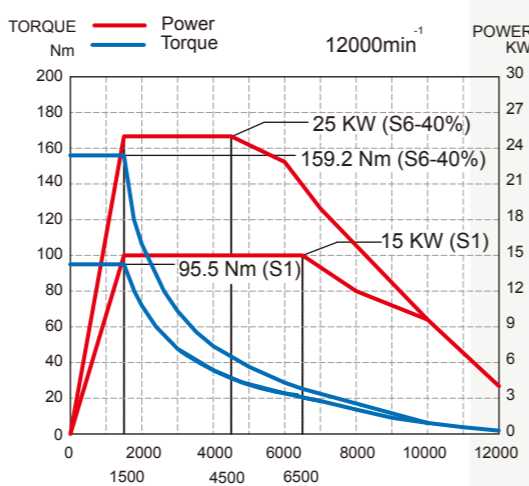
Spindle drives that provide the power and torque to machine the toughest materials

12000 RPM Belted Spindle with Siemens Control
XR 760 and XR1000



Siemens 1PH8133 / 13000 RPM Spindle Motor (Speed Limit 12000rpm)

12000 RPM Belted Spindle with Heidenhain Control
XR 760 and XR1000



Heidenhain QAN260M / 12000 RPM Spindle Motor

Rigidity...built like a rock from the ground up

Large capacity, fast performance ATC (Automatic Tool Changer)

Model	ATC Tool Positions	ATC Option	Tool Shank Taper
XR 760	30	48/60	#40
XR 1000	30	48/60	#40

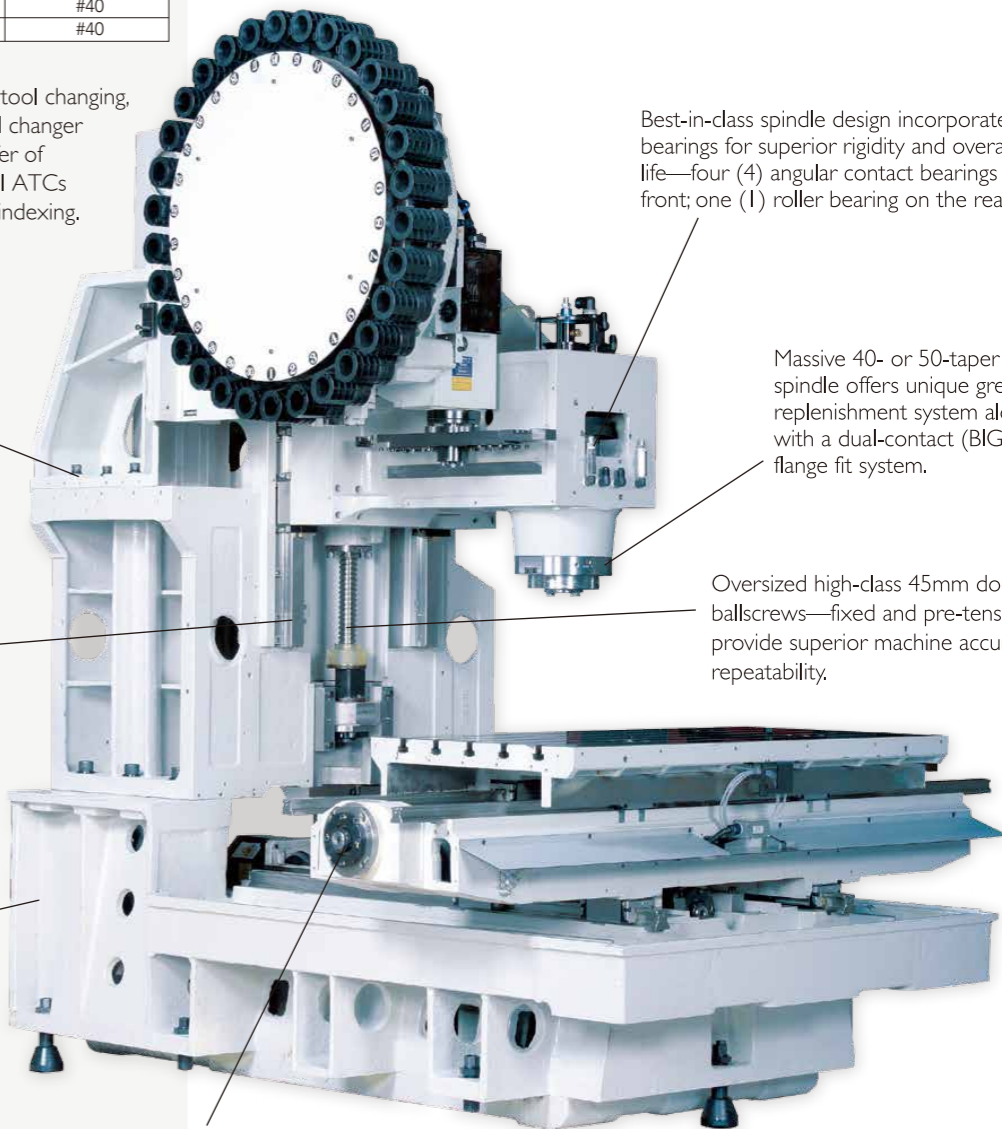
To ensure smooth and vibration-free tool changing, all XR-Series machines have their tool changer strategically located for minimal transfer of vibration—a unique design feature. All ATCs feature random-access, bi-directional indexing.

Unique ATC mount design for superior rigidity and minimized vibration to the cutting zone.

Large 45mm high-quality, low maintenance linear guideways provide greater positioning accuracy and superior finishes—very low friction and high stiffness for long machine life.

Highly engineered machine structure manufactured from grey cast iron—heavily ribbed throughout to ensure high overall rigidity and thermal stability.

Best overall working cube in its class— 24-inch Y-axis travel on XR 760 and XR 1000



XR 1000 shown

All geometric alignments conform to ISO 230 standards—every machine passes strict laser and ballbar tests.

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. Oversized 45mm ballscrews are featured on all the XR-Series VMCs shown in this brochure.



Standard features include :

- 12,000-rpm Spindle Speed
- CT40 or BT40 Taper Spindle
- BIG-PLUS Face Taper Contact
- High-Retention Draw Bar
- Thermal Compensation
- Chip Conveyor with Chip Washdown
- Cutter Air Blast
- Rigid Tapping
- 4th Axis Pre-wiring

Optional features include :

- Larger Capacity ATCs
- 9,000/15,000rpm High-speed Spindle
- Absolute Linear Glass Scales
- Tool Setting Probes
- Spindle Probe
- 4th Axis
- Hand-held Manual Pulse Generator
- 15,000rpm DDS High Speed Spindle
- 9,000rpm Belted High Torque
- 18,000rpm Motorised Spindle

XR-Series High-Performance Vertical Machining Centers

Unprecedented spindle technology second to none

Revolutionary spindle-the latest in spindle technology

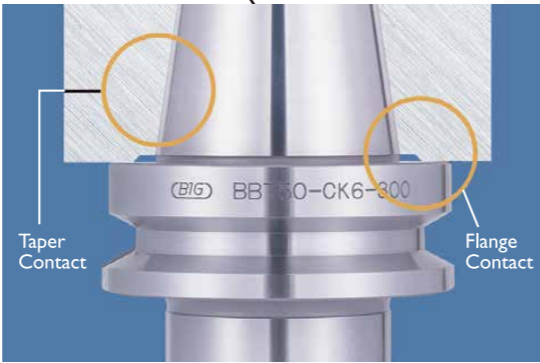
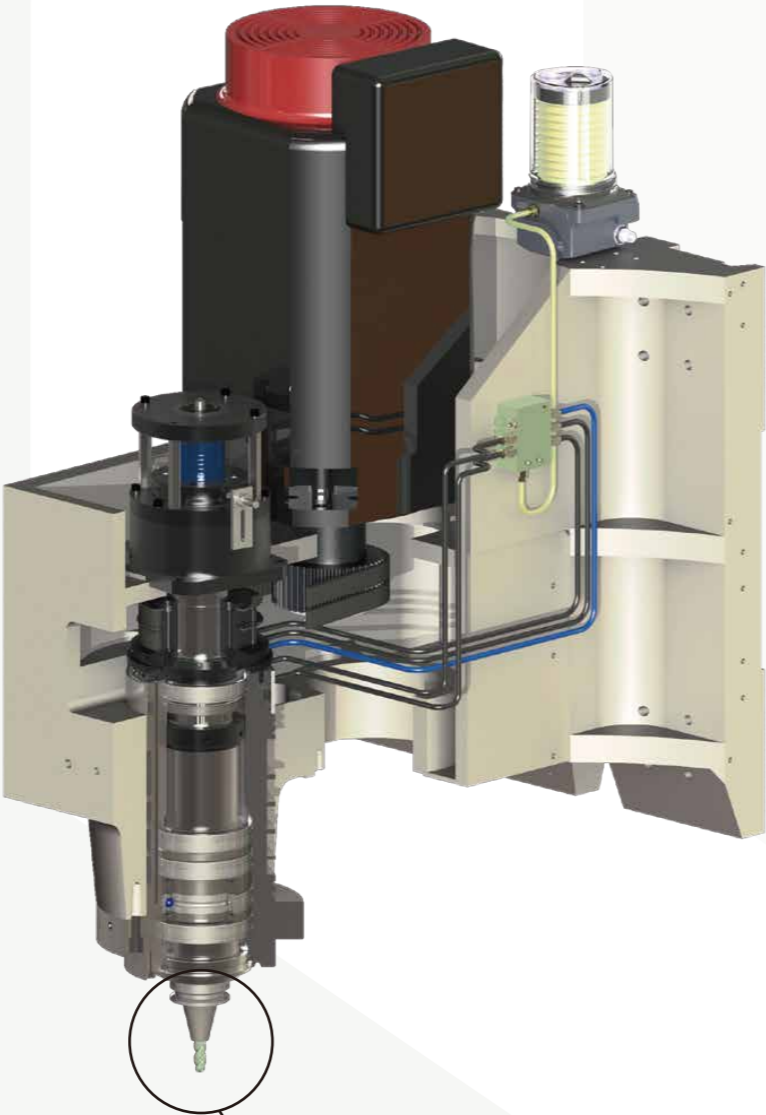
XR-Series VMCs are equipped with the very latest, high-performance spindle technology. The XR 760 through XR 1000 models are supplied with a powerful 12,000-rpm, 18.5-kW belted spindle drive; Other speeds and drive system options offered. The directly-coupled spindle configuration reduces spindle inertia and increases accel/decel times for increased productivity. Main features include low vibration and high power density—giving even greater rigidity and radial stiffness. The absence of drive traverse forces permits extremely high accuracy on the workpiece due to smooth, accurate spindle motion even at very low speeds.

BIG-PLUS dual contact spindle system

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



Thermally stable system for optimal spindle performance

Grease lubrication “on-the-fly”

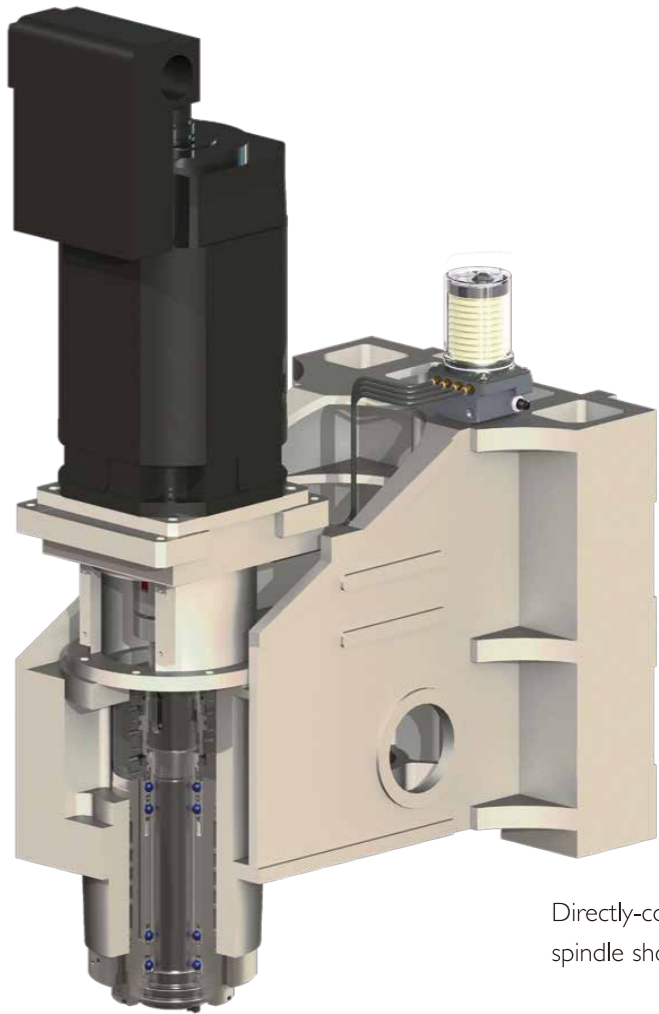
Longer grease life leads to longer spindle service life. Bridgeport XR-Series spindles offer 2-to-3 times longer life due to our grease replenishment technology that keeps the grease quality at a consistently high level. Lubrication cycles are controlled by an external grease replenishing unit, which is triggered based on cumulative spindle run time. Most other brand VMCs have no way to replenish grease. Not so with our system! The grease replenishing unit is integrated in the spindle, thus maintaining a totally sealed spindle. Fresh grease is injected very close to the raceway, pushing older grease away from the bearings. The benefit to this technology is higher permissible bearing preloads, resulting in higher rigidity, higher metal removal rates and the ability to run at higher spindle speeds for longer periods of time.

Eco cooling heat exchanger system

This heat exchanger system, which is standard on XR 760 and XR 1000 machines, cools the spindle to minimize thermal expansion, prolonging spindle life and allowing higher workpiece accuracy.

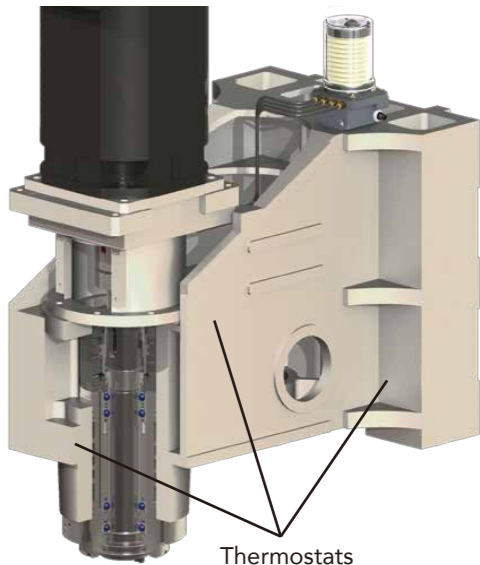
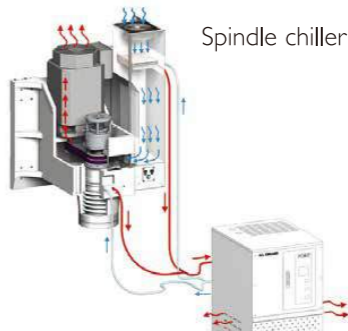
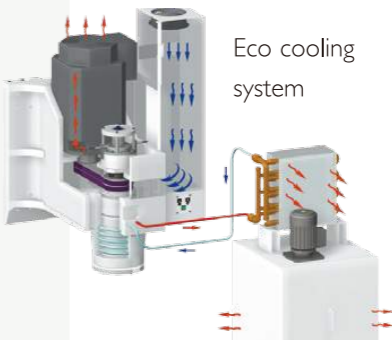
Spindle chiller

For extreme duty cycles, a spindle chiller offers the best solution to maintain constant spindle temperature. The chiller is available as an option on all models.



Dynamic thermal compensation

To minimize the effects of thermal expansion in the spindle head of XR 760 and XR 1000 machines, thermal compensation sensors (thermostats) positioned around the spindle casting are linked directly to the machine's control system. This ensures rapid and real time adjustment to the machine position, thus minimizing the effects of thermal expansion.



XR-Series High-Performance Vertical Machining Centers

Advanced digital control systems to unleash your productivity



Siemens 840Dsl Control

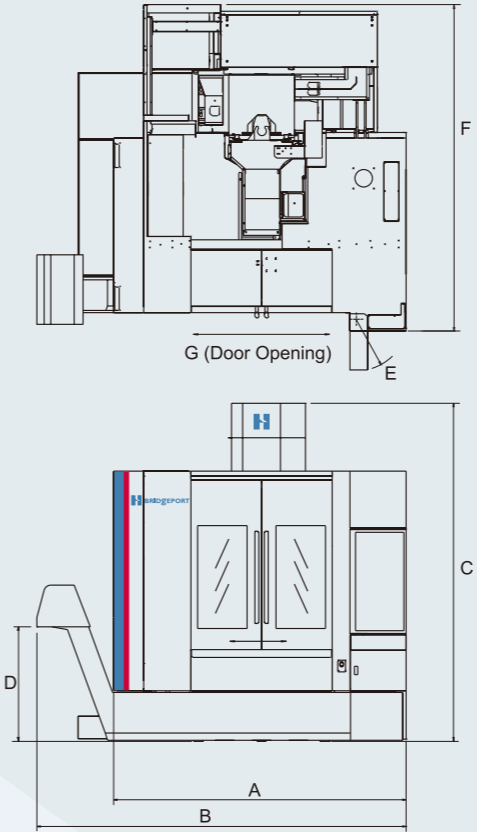
- Siemens 840Dsl Controller
- 19" TFT LCD display with Innovative sensor technology
- Part Program Storage-3MB CNC memory;2 GB internal Compact Flash
- MDI(Manual Data Input) Operation
- Inch/ Metric Data Selection by G-Code
- ShopMill
- 3D Simulation
- Animated element operation
- Measurement cycles
- ShopMill Step-programming
- ProgramGuide Conversational Programming
- EasyScreen
- Custom Cycles
- Interpolation (Linear and Circular)
- Scaling
- Registered Part Programs (1,000 programs)
- Pocketing/ tapping Cycle,Deep-Hole tapping Cycle
- Rigid Tapping
- Tool Life Management
- Helical Interpolation
- Cylindrical Interpolation
- Spiral/ conical Interpolation
- Spline Interpolation
- Manual Speed command



Heidenhain TNC640 HSCI Controller

- 383mm TFT Color Flat Panel Display with Soft Keys
 - Program Memory Solid State Disk (Minimum 21GB)
 - Interpolation
 - Straight Line in 4 Axes
 - Helix: Combination of Circular and Linear Motion
 - Circle in 2 Axes
 - 0.5ms Block Processing Time
 - Data Interfaces
 - Heidenhain Conversational Programming as per ISO
 - Tool Compensation
 - Several Tool Tables with Any Number of Tools
 - Cutting Data Tables
 - Constant Contouring Speed
 - Parallel Operation—create programs with graphic support while another program is running
 - Contour Elements—line segment, chamfer, circular arc, circle center, circle radius, tangentially connecting circular arc and corner rounding
- Contour Approach and Departure
 - FK Free Contour Programming
 - Program Jumps
 - Fixed Cycles
 - Coordinate Transformations
 - Q Parameters
 - Programming Aids
 - Actual Position Capture
 - Verification Graphics
 - Programming Graphics
 - Program Run Graphics
 - Machining Time
 - Returning to the Contour
 - Datum Tables
 - Pallet Tables
 - Touch Probe Cycles
 - Preset Table

Floor Plan



XR 1000 floor plan shown.

Dim.	XR 760	XR 1000
A	2150	2528
B	2844	3192
C	2921	2921
D	1100	1100
E	445	445
F	3000(30/48T) 3300(60T)	3000(30/48T) 3300(60T)
G	950	1100

* B = Distance to end of auger; D = Height to opening of auger.

1—Includes Oil Chiller: (30/48T)
2—Other voltages require external transformer.

Specifications

	XR 760	XR 1000
Axis Travel		
Table (X axis)	760 mm	1020 mm
Saddle (Y axis)	610 mm	610 mm
Head (Z axis)	610 mm	610 mm
Table Surface to Spindle Gauge Plane Distance (Min to Max)	100 to 710 mm	100 to 710 mm
Positioning		
Auto Mode (X and Y axes)	43 m/min	43 m/min
Auto Mode (Z axis)	36 m/min	36 m/min
Feedrate Range (X and Y axes)	.0025 - 20 m/min	.0025 - 20 m/min
Feedrate Range (Z axis)	.0025 - 20 m/min	.0025 - 20 m/min
Minimum Increment	.001 mm	.001 mm
Ball Screw Dia. and Pitch (X and Y axes)	45 x 16 mm	45 x 16 mm
(Z axis)	45 x 12 mm	45 x 12 mm
Spindle		
Siemens-Motor HP Rating (S6 40%)	26.3 kW	26.3 kW
Torque (S6 40%)	143 Nm	143 Nm
Heidenhain—Motor HP Rating (S6 40%)	25 kW	25 kW
Torque (S6 40%)	159.2 Nm	159.2 Nm
Retention Force	12,010 N	12,010 N
Spindle Taper	No. 40	No. 40
Tool Holder	CT40 or BT40 or DIN40	CT40 or BT40 or DIN40
Spindle Options		
Speed (Belted)	9,000 rpm	9,000 rpm
Siemens-Motor HP Rating (S6 40%)	26.3 kW	26.3 kW
Torque (S6 40%)	190 Nm	190 Nm
Heidenhain—Motor HP Rating (S6 40%)	25 kW	25 kW
Torque (S6 40%)	178 Nm	178 Nm
Speed (Directly Coupled)	15,000 rpm	15,000 rpm
Siemens& Heidenhain-Motor HP Rating (S6 40%)	21.9 kW	21.9 kW
Torque (S6 40%)	140 Nm	140 Nm
Worktable		
Working Surface	1000 x 600 mm	1200 x 600 mm
Table Load	700 kg	900 kg
Number of T-Slots	5	5
T-Slot Size	18 mm	18 mm
T-Slot Center Dimension	100 mm	100 mm
Control		
Siemens	840D	
Heidenhain	TNC 640 HSCI	
Automatic Tool Changer		
Magazine Capacity	30 Tools (48/60 opt)	30 Tools (48/60 opt)
Tool Select by Shortest Path and Random Select	Bi-Directional	Bi-Directional
Max. Tool Diameter (adjacent pockets)	125 mm	125 mm
Max. Tool Length	80 mm	80 mm
Max. Tool Weight	300 mm	300 mm
	7 kg	7 kg
Coolant and Chip Management		
Swarf Removal	Chip Conveyor	Chip Conveyor
Coolant Tank Capacity	300L	400 L
Wash Down	Standard	Standard
Wash Gun	Standard	Standard
Stainless Chip Pan	Standard	Standard
Cutter Air Blast	Standard	Standard
Through Spindle Coolant	Standard	Standard
Accuracy—ISO 230-2		
Positioning - A	0.010 mm	0.010 mm
Repeatability - R	0.004 mm	0.004 mm
Linear Scales Option		
Positioning	0.006 mm	0.006 mm
Repeatability	0.003 mm	0.003 mm
Machine Size		
Machine Dimensions (WxD)	2150 x 3000 mm	2528 x 3000 mm
Height	2921 mm	2921 mm
Mass of Machine	6450 kg (30T)	6700 kg (30T)
Installation Specifications		
Electrical Supply (Input)—Balanced 3-phase	50 or 60 Hz	50 or 60 Hz
Power	25 KVA	25 KVA
Voltage ²	208 - 230 or 380 - 440 volt	208 - 230 or 380 - 440 volt
Compressed Air (Pressure / Flow)	4.9 cfm	4.9 cfm
	140 L/min	140 L/min
Through Spindle Coolant Pressure	20 bar (Std)	20 bar (Std)
Nozzle Coolant	60 L/min	60 L/min
Wash Down	125 L/min	125 L/min