

BRIDGEPORT XR SERIES

HIGH PERFORMANCE
VERTICAL MACHINING CENTER
XR 600, XR 800 APC, & XR 1000



 **HARDINGE**[®]

Bridgeport[®]

BRIDGEPORT XR SERIES

HIGH PERFORMANCE VERTICAL MACHINING CENTER

AS YOUR NEEDS GROW, BRIDGEPORT HAS SOLUTIONS FOR INCREASED CAPACITY.

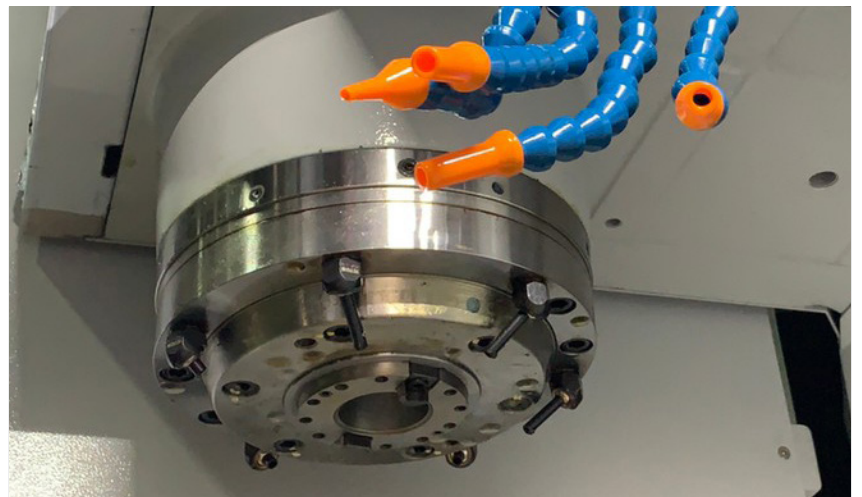
Whether you're machining simple workpieces, quality molds and dies, or complex prismatic parts, we've got just the right Bridgeport XR-Series machining center for your operation. Bridgeport XR machines easily satisfy the most demanding production and precision component machining requirements in the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

When more X-axis travel is needed, then the XR1000 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 (nickle-based alloys).

To further increase productivity, XR-Series VMCs are configuring for 4-axis machining with an optional interface and rotary table.

STANDARD FEATURES

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



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
XR1000	30	48/60	#40

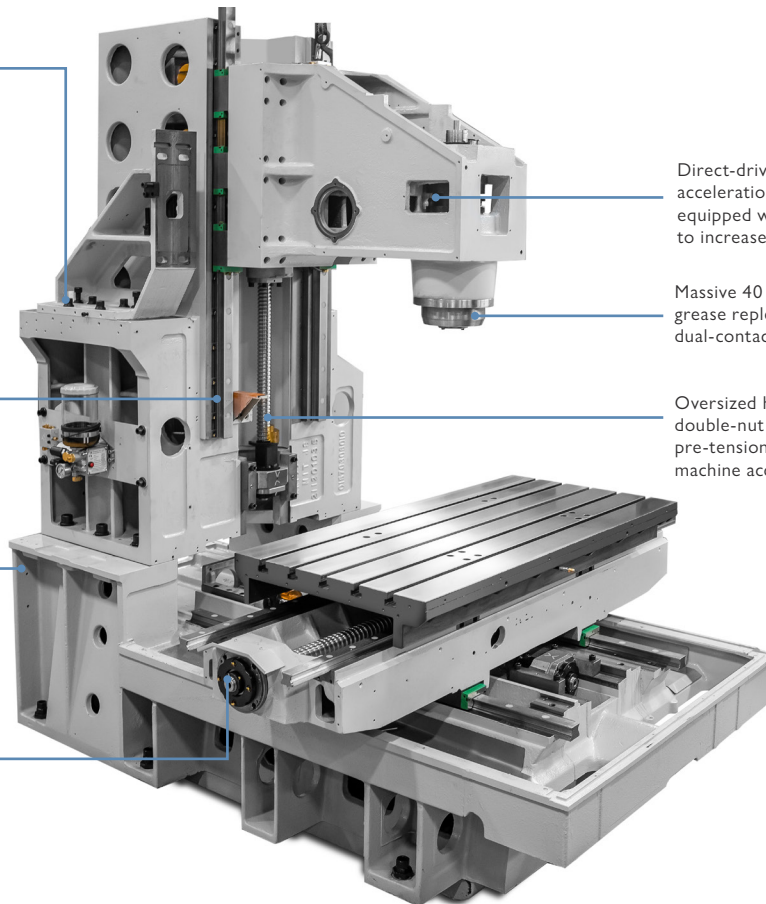
To ensure smooth an vibration-free tool changing, XR-Series machines have their tool changer strategically located for minimal transfer of vibration—a unique design feature. All ATCs feature random-access, bi-directional indexing.

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

Large 45mm high-quality, low maintenance linear guideways provide great positioning accuracy and superior finish—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.

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



Direct-drive spindle provides fast acceleration and deceleration time, and equipped with double big O type bearings to increase rigidity.

Massive 40 taper spindle offers unique grease replenishment system along with a dual-contact (BIG-PLUS) flange fit system.

Oversized high-class 45mm double-nut ballscrews—fixed and pre-tensioned to provide superior machine accuracy and repeatability.

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 position 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 the XR1000.



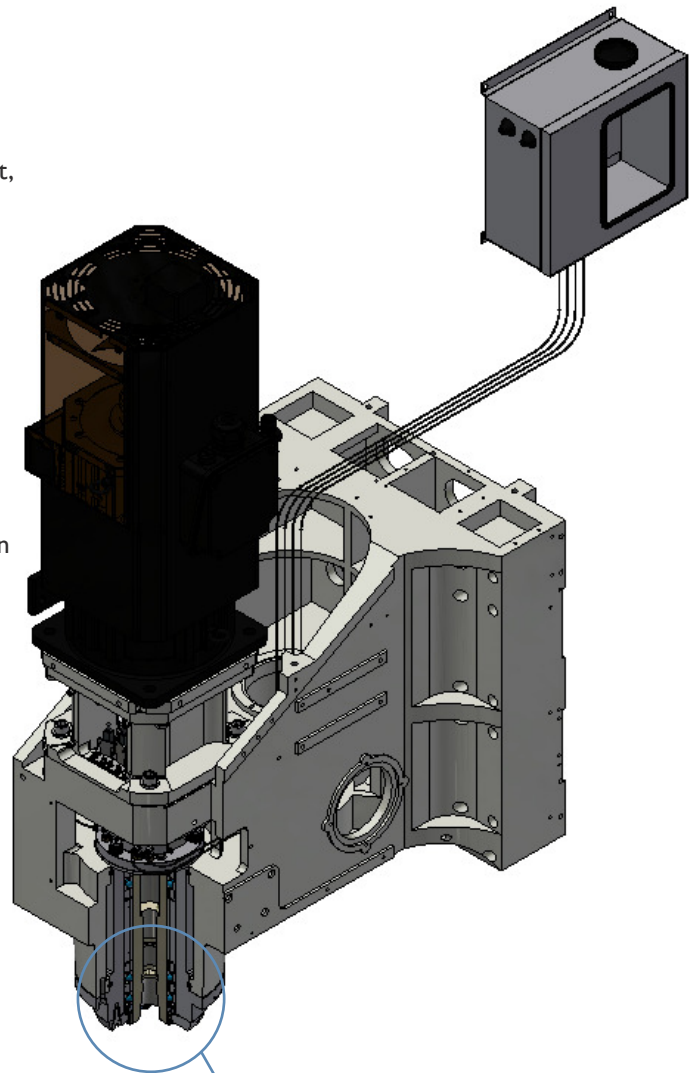
OPTIONAL FEATURES:

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

UNPRECEDENTED SPINDLE TECHNOLOGY SECOND TO NONE

REVOLUTIONARY SPINDLE - THE LATEST IN SPINDLE TECHNOLOGY

The XR1000 machines are equipped with the very latest, high performance spindle technology. The XR1000 is supplied with a powerful 12,000-rpm, 25 kW direct drive spindle; 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-AXIAL MOVEMENT

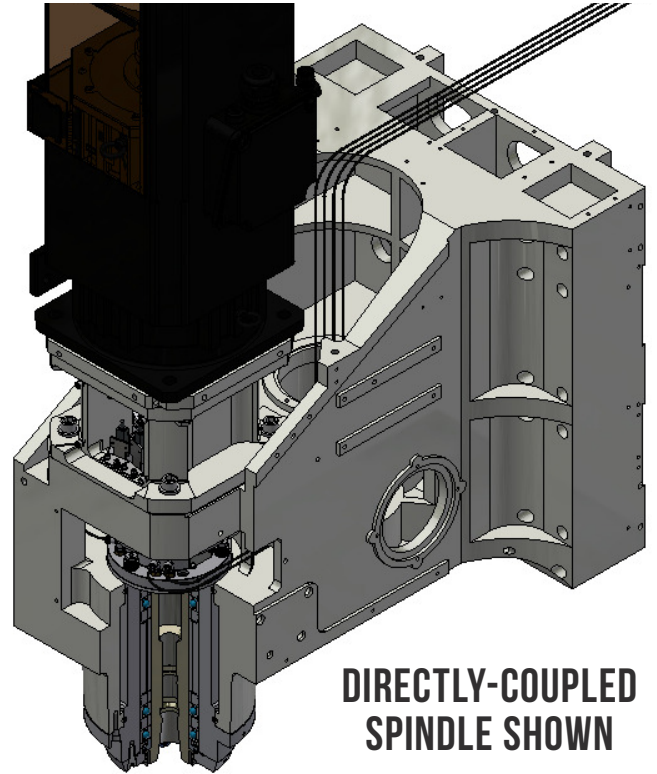
At high rotational spindle speeds, the mouth of the machine spindle can expand slightly due to centrifugal force. As the machine spindle expands, the conventional toolholder, which under constant draw bar pulling pressure, moves further into the spindle. On high tolerance applications, the slight pull 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.



THERMAL STABLE SYSTEM FOR OPTIMAL SPINDLE PERFORMANCE

OIL-AIR LUBRICATION

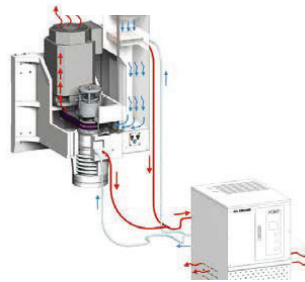
1. Oil-air lubrication offers lubrication that is targeted to the bearing and is especially suitable for very high rotation speeds.
2. The lubricant is mixed with air and delivered in cycles through a feed hose and distributed evenly to the lubrication points.
3. Oil-air lubrication ensures the highest efficiency for spindle that have long duration runs and maximum rotation speeds:
 - Minimal friction losses
 - Low heat generation
 - High operating safety
 - Adjustable lubricant supply
 - Low oil consumption
 - Low oil mist formation



**DIRECTLY-COUPLED
SPINDLE SHOWN**

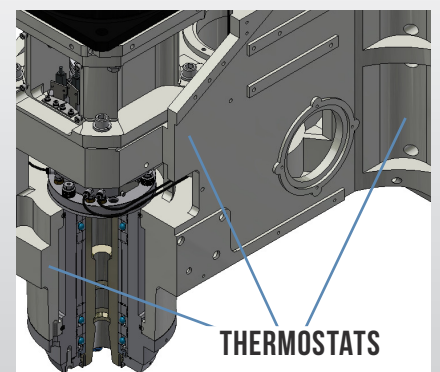
SPINDLE CHILLER

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 the thermal expansion in the spindle near the XRI000 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.



ADVANCED DIGITAL CONTROL SYSTEMS

POWER & TORQUE TO MACHINE THE TOUGHEST MATERIALS

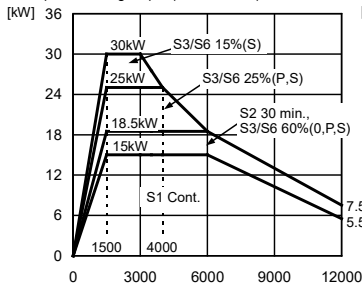


FANUC FANUC OIMF-PLUS

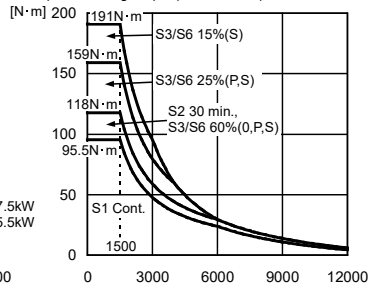
- 15" LCD Color Display
- Programmable Data Input
- PCMCIA Card Slot
- Workpiece Coordinate System
- Manual Pulse Generator (Handwheel)
- Coordinate System Rotation
- Rigid Tapping
- Tool Life Management
- Tool Length compensation
- Background Editing
- Ethernet Ready/ RS232 Ready/ USB Slot
- Additional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

FANUC SPINDLE

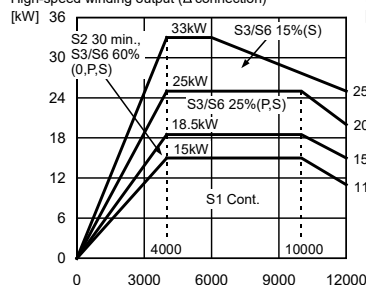
Low-speed winding output (Y connection)



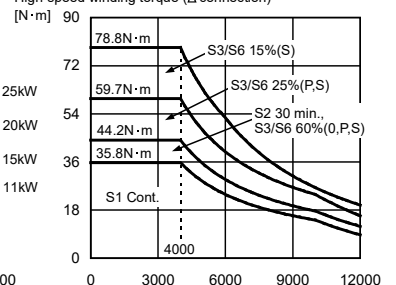
Low-speed winding torque (Y connection)



High-speed winding output (Δ connection)



High-speed winding torque (Δ connection)



FANUC spindle motor spec: AIT I5/I2000-B(A06B-2469-BI23)

ADVANCED DIGITAL CONTROL SYSTEMS

POWER & TORQUE TO MACHINE THE TOUGHEST MATERIALS



MC 8522(15") TE 735

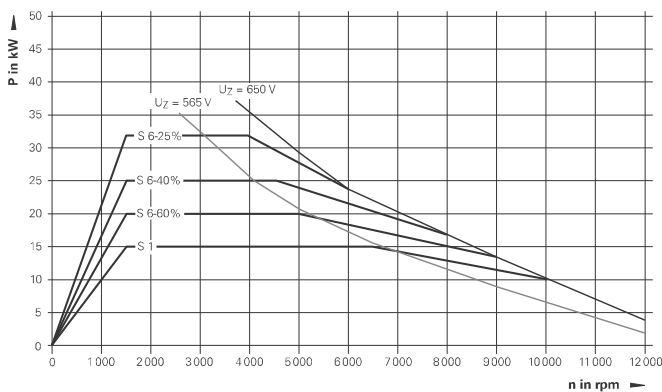
HEIDENHAIN

HEIDENHAIN TNC 640 HSCI FOR GEN3 DRIVES

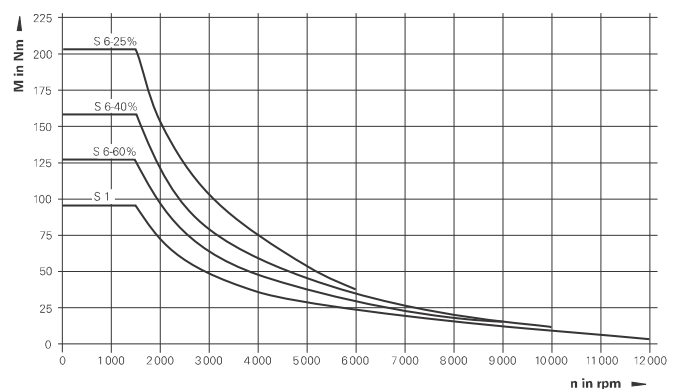
- For operation with HEIDENHAIN inverter systems and ideally HEIDENHAIN motors
- Uniformly digital with HSCI interface and EnDat interface
- Version with touchscreen for multitouch operation
- Solid state disk (SSDR)
- Programming in HEIDENHAIN Klartext or G-code (ISO)
- Comprehensive cycle package for milling and turning operations
- Constant surface speed for turning operations
- Tool radius compensation
- Touch probe cycles
- Free contour programming (FK)
- Special function for fast 3-D machining
- Short block processing time (0.5 ms)

HEIDENHAIN SPINDLE

Power characteristic curve



Torque characteristic curve

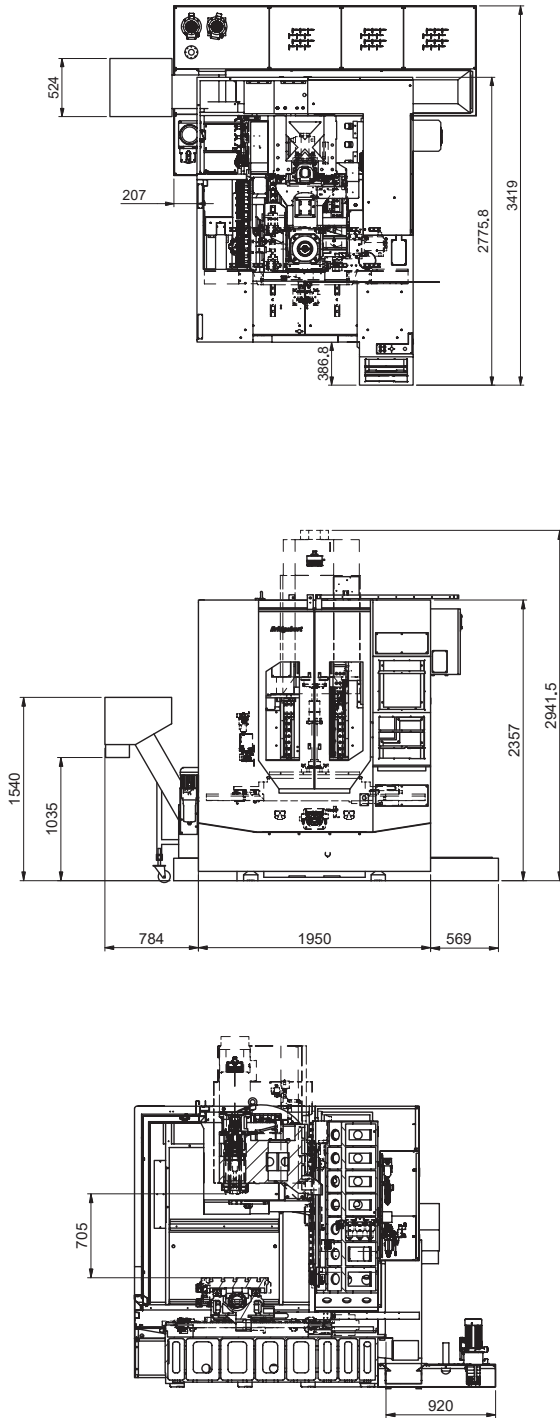


HEIDENHAIN spindle motor spec:
OAN 260 M, OAN 260 MH

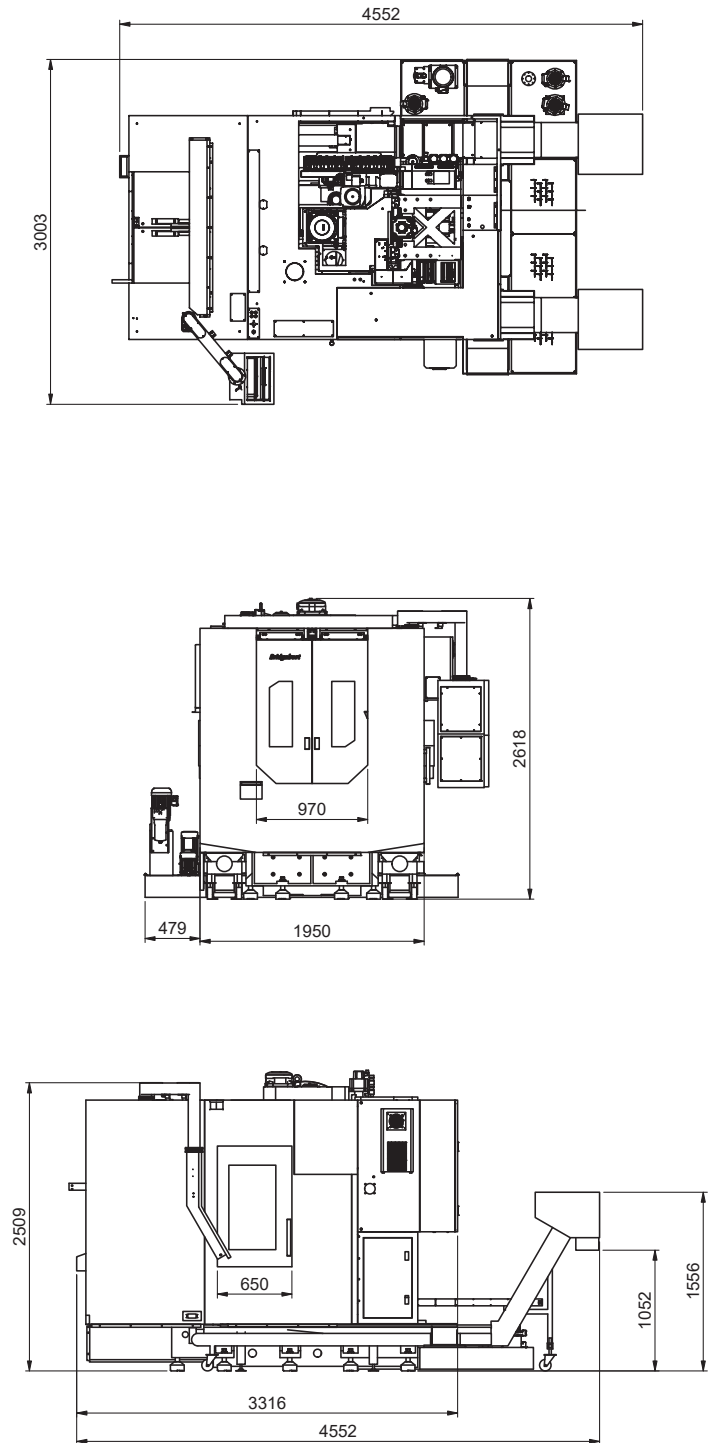
Conversational programming features offered on the CNC control is the CNC control builder's standard product, which may not fully support all machine functions. It is recommended the end user reference the control system documentation, or contact the control manufacturer, for further details of use or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

FLOOR PLANS XR 600 & XR 800 APC

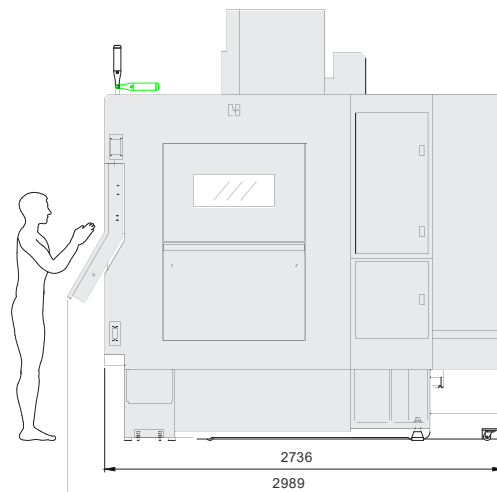
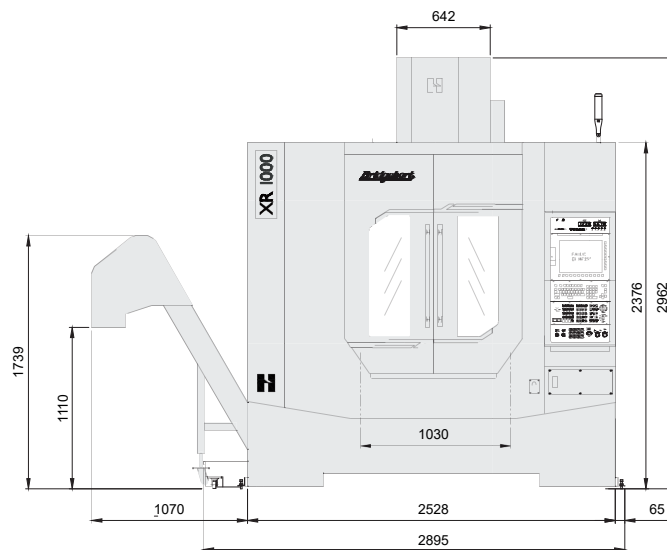
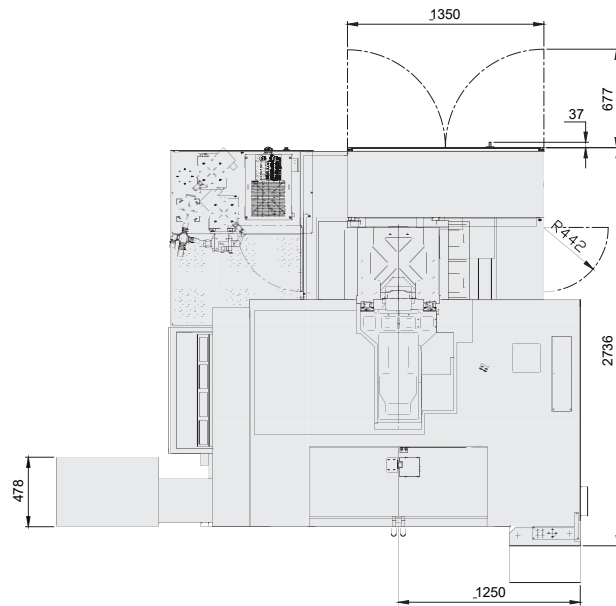
Bridgeport XR 600



Bridgeport XR 800 APC



FLOOR PLANS XR 1000



SPECIFICATIONS XR 600 & XR 800 APC

Machine Model	XR 600	XR 800 APC
Control Unit	Fanuc 0i-MF Plus 15" touch / Heidenhain TNC640	
Travels		
X-Axis	600mm (23.622")	800mm (31.496")
Y-Axis	560mm (22.047")	
Z-Axis	560mm (22.047")	
Gage Line Height (Min-Max)	150-710mm (5.905"x 27.952")	
Y-Axis Throat Distance	581mm (22.874")	
Table		
X Length	750mm (29.527")	
Y Width	560mm (22.047")	
Load Capacity	700kg (1543.24b)	
T-Slots (# & Size)	5x18mmx125mm (5x0.708"x 4.921")	
Automatic Pallet Changer (2 position, Front) APC		
Table Length		850mm (33.464")
Table Width		500mm (19.685")
Table Max. Load (Each Table)		300kg x 2
Clamping Force		36000N
Table (Screw Type)		5x18mmx100mm
APC Change Time		11±1 sec
APC Change Type (2 Table)		Turn Table
Spindle Transmission		
Taper ISO No.	ISO 40	
Max. Spindle Speed (RPM)	12000 (STD) / 15000 (OPT)	
Transmission	DDS	
Main Motor Horse Power	QAN 260 MH 12000rpm 15KW 15kw(S1) / 20 kw(S6-60%)/32 kw(S6 25%)	
Maximum Torque at Base Speed	95(S1)/127.3(S6-60%)/203.7(S6-25%), Base speed 1500rpm	
Lubrication	Grease / Kluber NBU15	
Spindle Bearing Protection	Air Purge	
Tapping Speed (Max. RPM)	3000rpm	
Spindle taper cleaning	Air blast	
DRAW BAR		
Actuation	Pneumatic	
Clamp force	900kg (1984.16b)	
Clamp method	Helical Disk Springs	
Automatic Tool Changer (ATC)		
Taper (ISO No.)	NO.40	
Type	Swing Arm	
Tool Holder Type	CT40 or BT40 or DIN40(SK)	
Tool Selection	Random Bi-directional	
Tool Capacity	30 / 48 / 60	
Maximum Tool Diameter (Full Drum)	75mm (2.952")	
Max. Tool Diameter (Adj. Pockets Empty)	150mm (5.905")	
Maximum Tool Length	300mm (11.811")	
Maximum Tool Weight	7Kg (15.43lb)	
Tool Change Time (T-T)	1.3~1.5 Sec	
Tool Change Time (C-C) ISO10791-9	3~3.5 Sec	
ATC Transmission	Cam	

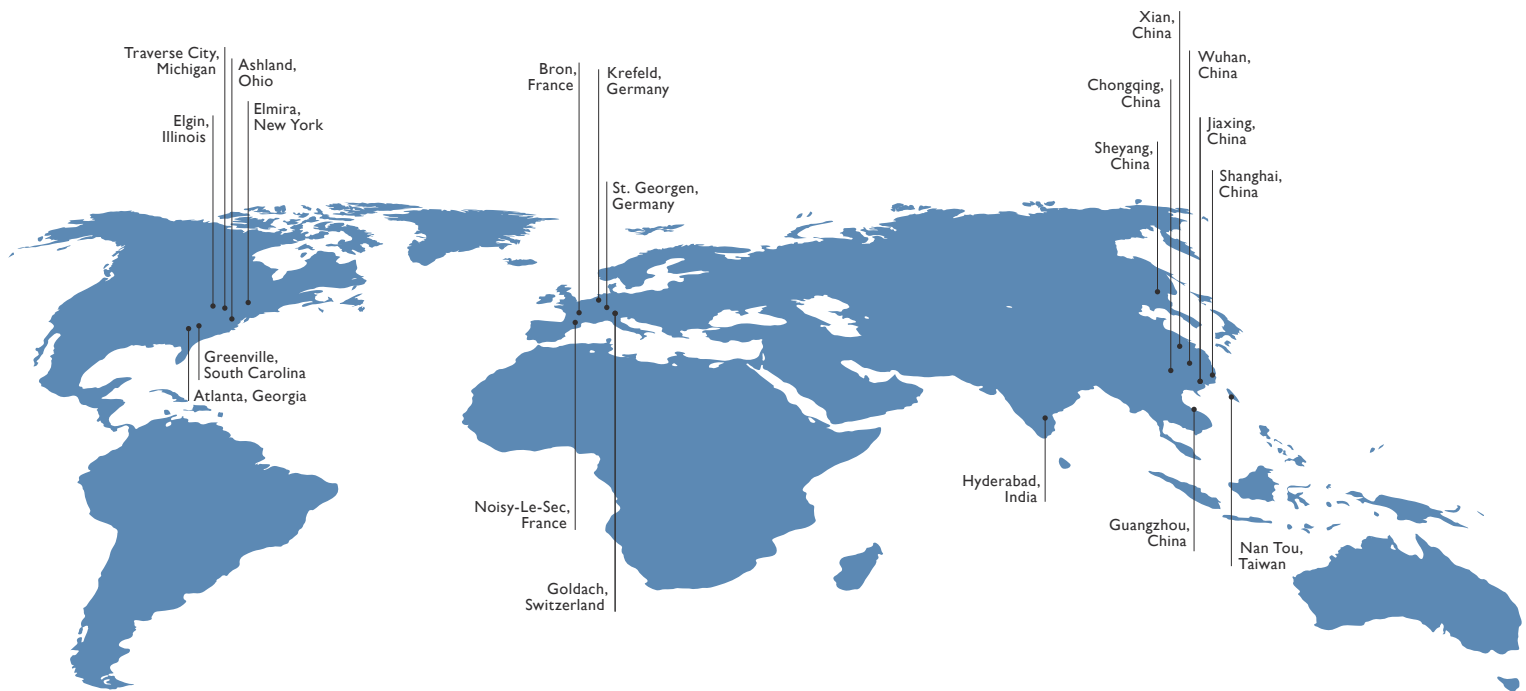
Machine Model	XR 600	XR 800 APC
Axes Drives		
X axes servo motors	QSY 155C/4200 rpm, 4.5kw/14.4Nm	
Y axes servo motors	QSY 155C/4200 rpm, 4.5kw/14.4Nm	
Z axes servo motors with Brake	QSY 155D/4200 rpm, 5.1kw/16.3Nm	
Ball Screws		
Ball Screw Size/Support	Fixed pre-tensioned	
X-Axis	45mm (1.77")	
Y-Axis	45mm (1.77")	
Z-Axis	45mm (1.77")	
Double Nut (Ball Nut)	STD	
Lubrication	Automatic Centralized Lubrication Grease	
Ball Screw Pitch (X/Y/Z)	12mm (0.472")	
Linear Guideway		
Type	Roller Guide	
Way Size (X/Y/Z)	35/45/45	
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	Automatic central grease lubrication	
X, Y, and Z-Axis Rapid Traverse Rate	48 m/min	
Max.programmable feed rates (all axes)	20 m/min	
Accuracy		
ISO 230-2 2σ		
Positioning X, Y, Z (with scale)	0.004mm	
Repeatability X, Y, Z (with scale)	0.003mm	
Positioning X, Y, Z (without scale)	0.009mm	
Repeatability X, Y, Z (without scale)	0.004mm	
General Specifications		
Machine Weight	6100kg (13500lb)	8400kg (18500lb)
Machine Overall Width(Chip conveyor not included)	2726mm (107.32")	2726mm (107.32")
Machine Overall Height	2941mm (115.787")	3320mm (130.7")
Machine Overall Depth (Chip conveyor not included)	3419mm (134.60")	3975mm (156.496")
Front Door opening	940mm (37")	940mm (37")
Window material	Laminated Panel (Lexan/Glass)	
Coolant Tank Capacity (Liters)	400L	
Coolant Flow Rate for Cutter (L/min)	TPHK-4T 3-2, 130L/min, 1.5kg/cm2 (60HZ) / TPHK-4T 3-3, 130L/min, 1.25kg/cm2 (50HZ)	
Coolant Flow Rate for Flush (L/min) (OPT)	TPHK-4T 6-6, 130L/min, 4.0kg/cm2 (60HZ) / TPHK-4T 7-7, 130L/min, 2.15kg/cm2 (50HZ)	
Chip Removal	Chip conveyor	
Air Requirements (PSI/SCFM)	6 kg/cm ² minimum	
Power Requirements (FLA/VOLTS/PHASE)	80 Amp/220V/3	87 Amp/220V/3
Distance floor to surface of table	917mm (36.1")	1081mm (42.559")

SPECIFICATIONS XR 1000

Machine Model	XR 1000
Control Unit	FANUC 0i-MF Plus 15" touch
Travels	
X-Axis	1020mm (40.16")
Y-Axis	610mm (24")
Z-Axis	610mm (24")
Gage Line Height (Min-Max)	100-710mm (3.94"-27.95")
Y-Axis Throat Distance	628mm (24.72")
Table	
X Length	1300mm (51.18")
Y Width	600mm (23.6")
Load Capacity	900kg (2000lb)
T-Slots (# & Size)	5×18mm (0.708")×125mm (3.94")
Spindle Transmission	
Taper ISO No.	40
Transmission	DDS
Max. Spindle Speed (RPM)	12000 RPM-Oil Air (STD)
Belt Ratio (Motor: Spindle)	N/A
Main Motor Horse Power (Continuous/30min)	A06B-1230-K469#S0S (ailT15/12000(Hollow shaft motor)) 15kw(S1 Cont.) /18.5kw(S2 30min) /25 kw (S3 25%) /30kw(S3 15%)
Maximum Torque at Base Speed	95.5 N-m (S1 Cont.) Base speed:1500rpm/ 118 N-m (S2 30min) Base speed:1500rpm/ 159 N-m (S3-25%) Base speed:1500rpm/ 191 N-m (S3-15%) Base speed:1500rpm
Lubrication	Oil Air (STD)
Spindle Bearing Protection	Air Purge
Tapping Speed (Max. RPM)	3000rpm
Spindle taper cleaning	Air blast
DRAW BAR	
Actuation	Pneumatic
Clamp force	900kg (2000lb)
Clamp method	Helical Disk Springs
Automatic Tool Changer (ATC)	
STANDARD	
Taper (ISO No.)	40
Type	Swing Arm
Tool Holder Type	BT or CAT or DIN (SK)
Pull Stud Type	1. BT or BT modified BT for CAT, 2. DIN
Tool Selection	Random Bi-directional
Tool Capacity	30
Maximum Tool Diameter (Full Drum)	75mm (2.95")
Max. Tool Diameter (Adj. Pockets Empty)	150mm (5.90")
Maximum Tool Length	300mm (11.81")
Maximum Tool Weight	7kg (15.43lb)
Tool Change Time (T-T)	1.5 Sec
Tool Change Time (C-C) ISO10791-9	3.7 Sec
ATC Transmission	Cam
Axes Drives	
X axes servo motors	3.0Kw(A06B-2243-B100 AIF12/4000 rpm)
Y axes servo motors	3.0Kw(A06B-2243-B100 AIF12/4000 rpm)
Z axes servo motors with Brake	4.0Kw(A06B-2247-B400 AIF22B/3000 rpm)

Ball Screws	
Ball Screw Size/Support	Fixed pre-tensioned
X-Axis	45mm (1.77")
Y-Axis	45mm (1.77")
Z-Axis	45mm (1.77")
Double Nut (Ball Nut)	STD
Lubrication	Auto Central Lubrication
Ball Screw Pitch	X/Y: 16mm, Z: 12mm
Linear Guideway	
Type	Ball Guide
Way Size(X/Y/Z)	35/45/45
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	Auto Central Lubrication
X, Y, and Z-Axis Rapid Traverse Rate	X/Y: 48m/min, Z: 36m/min
Max. programmable feed rates (all axes)	20m/min
Accuracy	ISO 230-2 2σ
Positioning X, Y, Z	0.01mm (With optical scales: 0.005mm)
Repeatability X, Y, Z	0.005mm (With optical scales: 0.004mm)
General Specifications	
Machine Weight	7000kg (15400lbs)
Machine Overall Width	3663mm (Include the Chip conveyor)
Machine Overall Height	2962mm (116.6142")
Machine Overall Depth	2994mm (117.87")
Front Door opening	1030mm
Window material	Laminated Panel (Lexan/Glass)
Coolant Tank Capacity (Liters)	385L
Coolant Flow Rate for Cutter (L/min)	TPHK-4T 3-2, 130L/min, 1.5kg/cm ² (60HZ) / TPHK-4T 3-3, 130L/min, 1.25kg/cm ² (50HZ)
Coolant Flow Rate for Flush (L/min) (OPT)	TPHK-4T 6-6, 130L/min, 4.0kg/cm ² (60HZ) / TPHK-4T 7-7, 130L/min, 2.15kg/cm ² (50HZ)
Chip Removal	Chip Conveyor
Air Requirements (PSI/SCFM)	85psi/7.2 SCFM
Power Requirements (FLA/VOLTS/PHASE)	84A / 220 volt / 3 phase
Distance floor to surface of table	861mm (33.897")

HARDINGE WORLDWIDE



Hardinge is a leading international provider of advanced metal-cutting solutions. We provide a full spectrum of highly reliable CNC turning, milling, grinding, and honing machines as well as technologically advanced workholding accessories.

The diverse products we offer enable us to support a variety of market applications in industries including aerospace, agricultural, automotive, construction, consumer products, defense, energy, medical, technology, transportation and more.

We've developed a strong global presence with manufacturing operations in North America, Europe, and Asia. Hardinge applies its engineering and applications expertise to provide your company with the right machine tool solution and support every time.

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