

# BRIDGEPORT XR SERIES

HIGH PERFORMANCE  
VERTICAL MACHINING CENTER

XR 600, XR 800 APC, & XR 1000



 **HARDINGE**<sup>®</sup>

***Bridgeport***<sup>®</sup>

# 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 APC

Model	APC Tool Positions	APC Option	Tool Shank Taper
XRI000	30	48/60	#40

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

Unique APC 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.

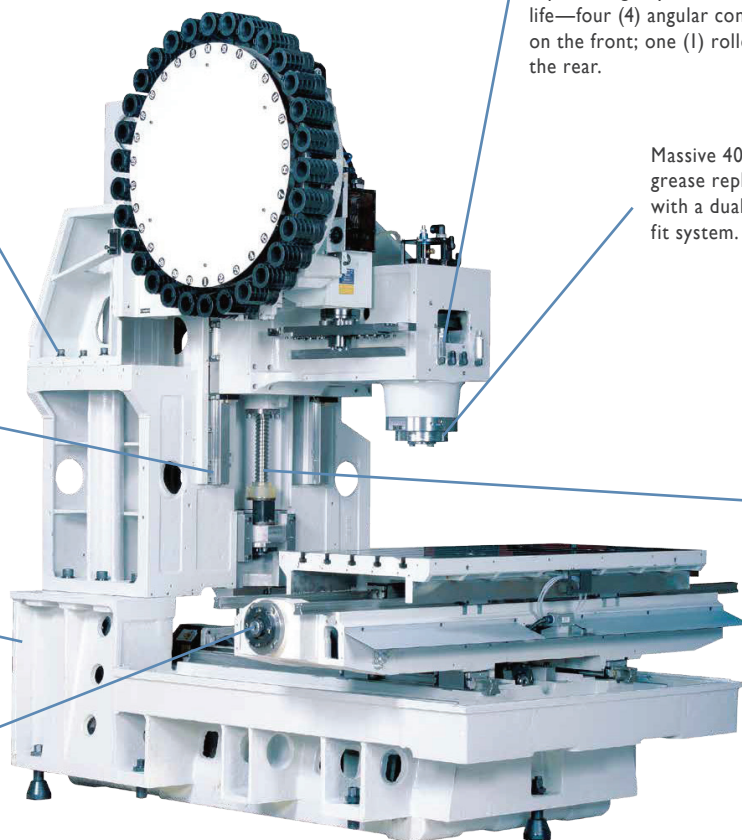
Highly engineered machine structure manufactured from grey cast iron—heavily ribbed throughout to ensure high overall rigidity and thermal stability.

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

Best-in-class spindle design incorporates five (5) bearings for superior rigidity and overall spindle life—four (4) angular contact bearings on the front; one (1) roller bearing on the rear.

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 XRI000.



## OPTIONAL FEATURES:

- Larger Capacity APCs
- 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

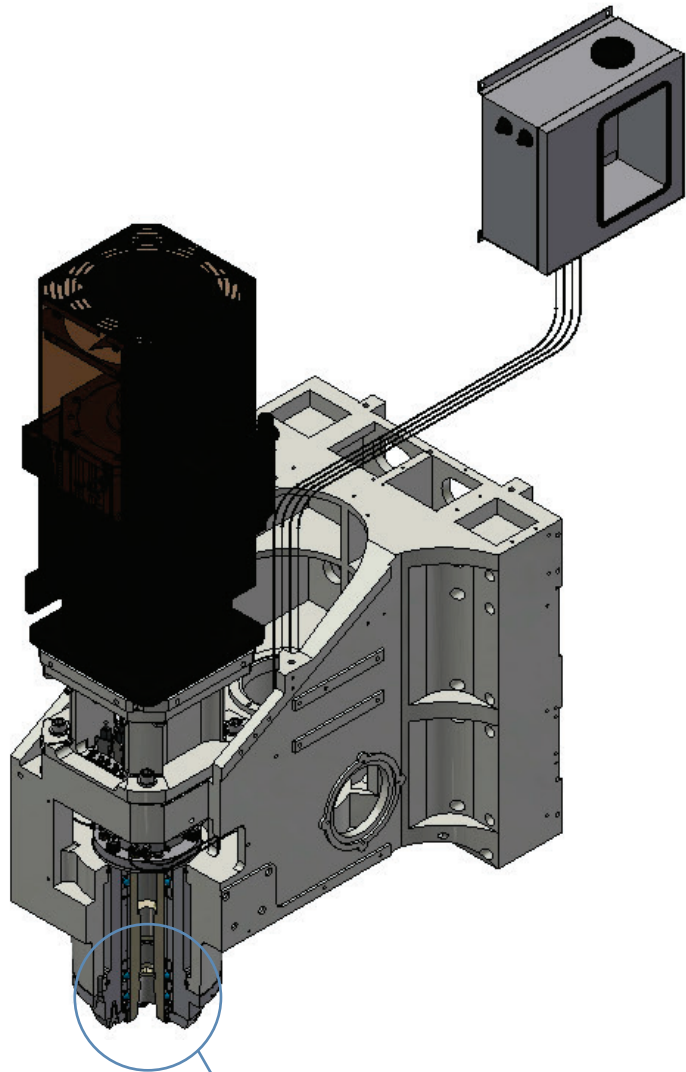
The XR1000 machines are equipped with the very latest, high performance spindle technology. The XR1000 is supplied with a powerful 12,000-rpm, 25 kW direct drive spindle; other speeds and drive system options offered. The directly-coupled spindle configuration reduces spindle inertia and increases accel/decel 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

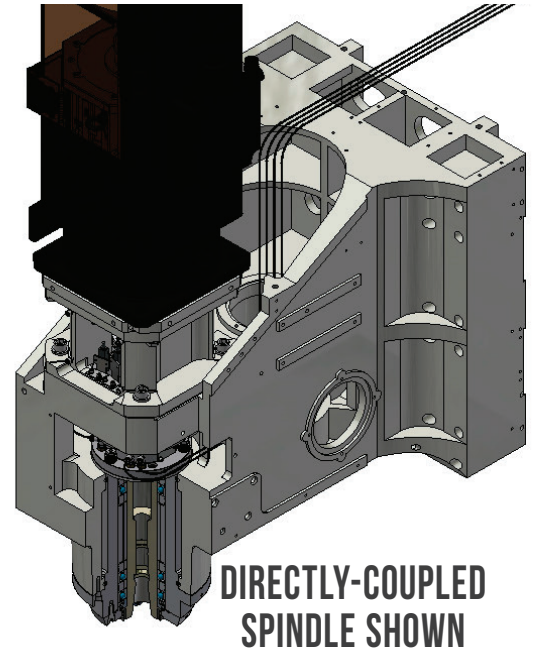
At high rotational spindle speeds, the mouth of the machine spindle can expand slightly due to centrifugal force. As the machine spindle expands, the conventional toolholder, which under constant draw bar pulling pressure, moves further into the spindle. On high tolerance applications, the slight pull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

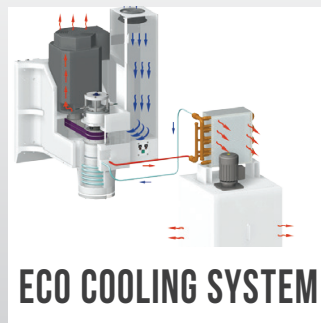
## OIL-AIR LUBRICATION

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



## ECO COOLING HEAT EXCHANGER SYSTEM

This heat exchanger system, which is standard on the XRI1000 machines, cools the spindle to minimize thermal expansion, prolonging spindle life and allowing higher workpiece accuracy.

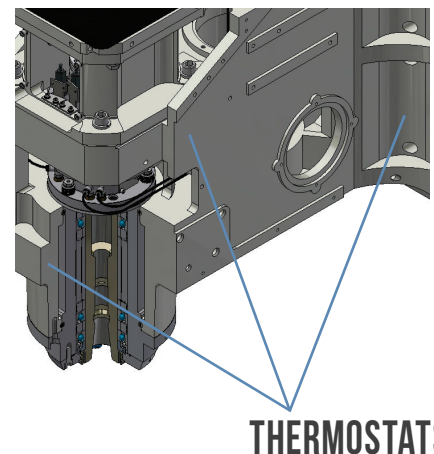


## DYNAMIC THERMAL COMPENSATION

To minimize the effects of the thermal expansion in the spindle hear the XRI1000 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.

## 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.



# ADVANCED DIGITAL CONTROL SYSTEMS

## FANUC

### FANUC OIMF-PLUS

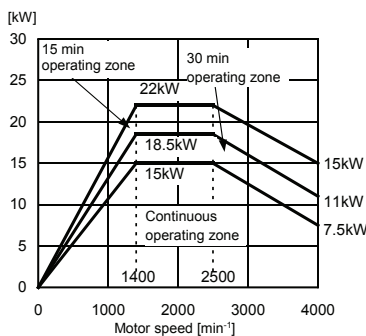
- 15" LCD Color Display
- Programmable Data Input
- PCMCIA Card Slot
- Workpiece Coordinate System
- Manual Pulse Generator (Handwheel)
- Coordinate System Rotation
- Rigid Tapping
- Tool Life Management
- Tool Length compensation
- Background Editing
- Ethernet Ready/ RS232 Ready/ USB Slot
- Additional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



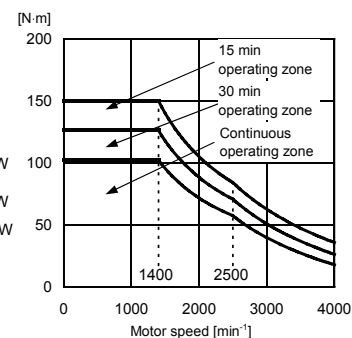
Conversational programming features offered on the CNC control is the CNC control builder's standard product, which may not fully support all machine functions. It is recommended the end user reference the control system documentation, or contact the control manufacturer, for further details of use or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

## SPINDLE DRIVE THAT PROVIDED THE POWER & TORQUE TO MACHINE THE TOUGHEST MATERIALS

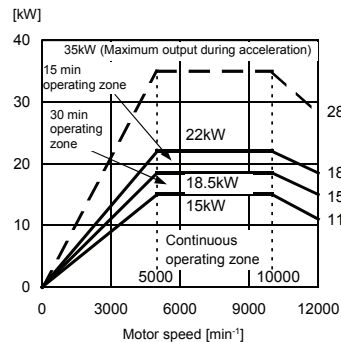
Low-speed winding output (Y connection)



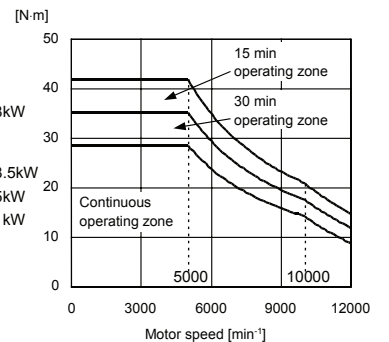
Low-speed winding torque (Y connection)



High-speed winding output (Y connection)

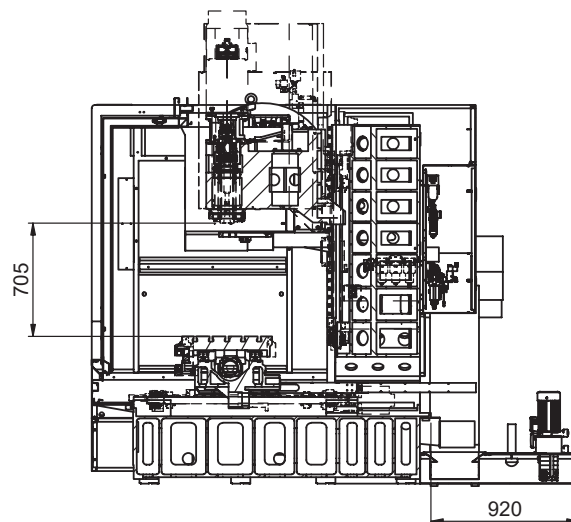
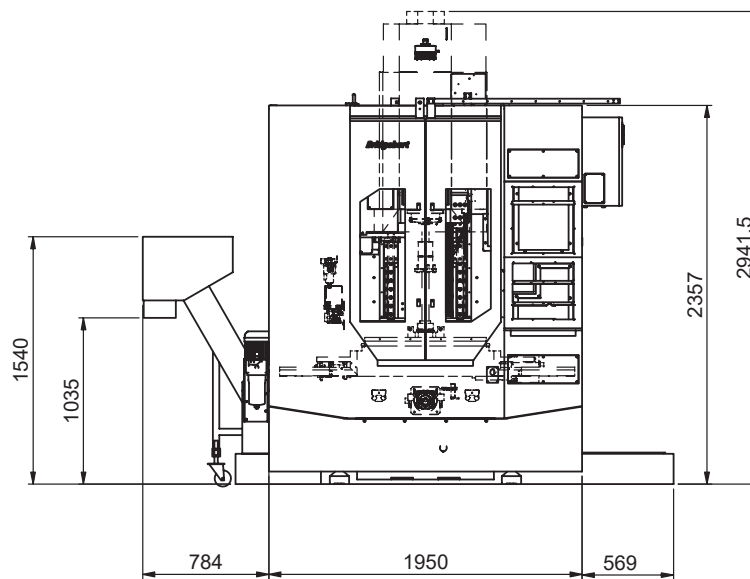
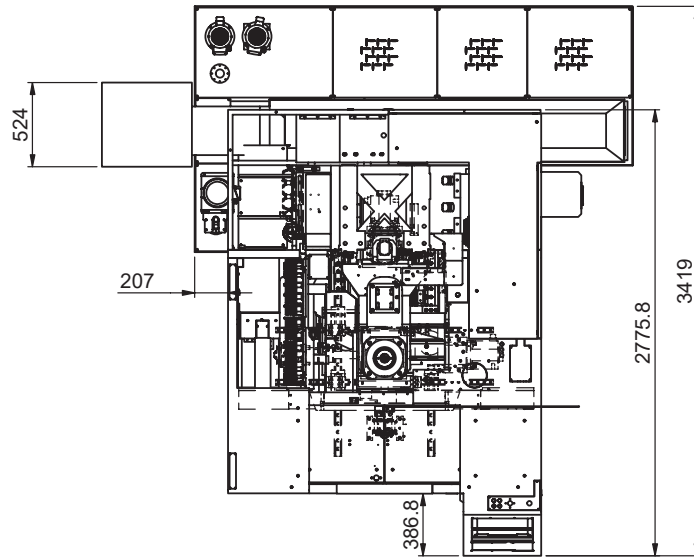


High-speed winding output (Y connection)

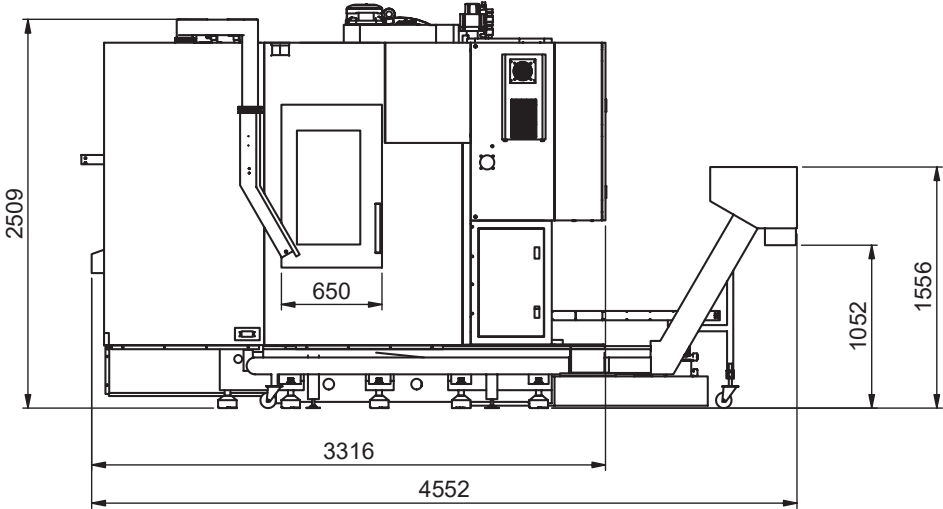
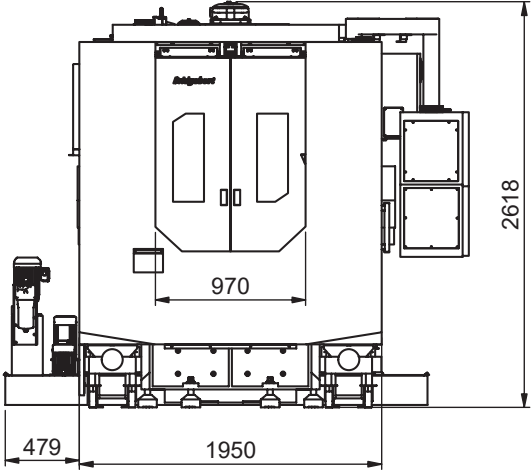
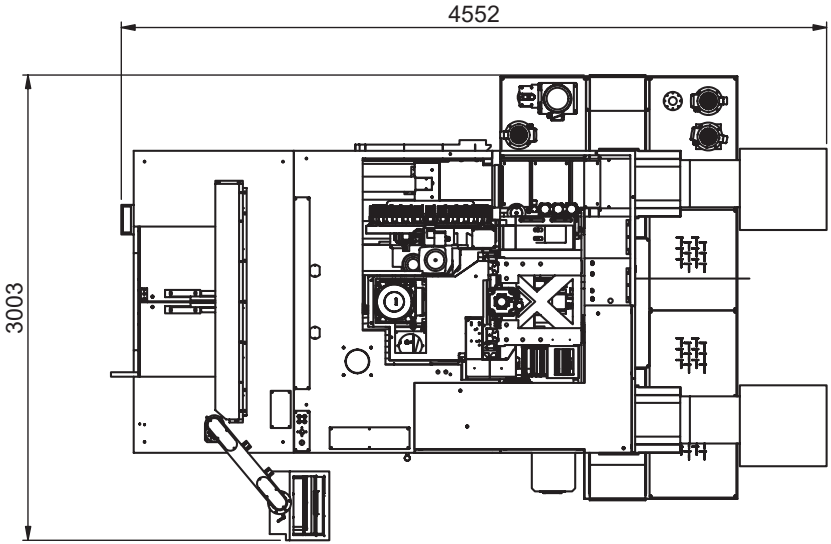


FANUC spindle motor spec  
AIIT 15/12000-B(A06B-2469-B123)

# FLOOR PLANS XR 600

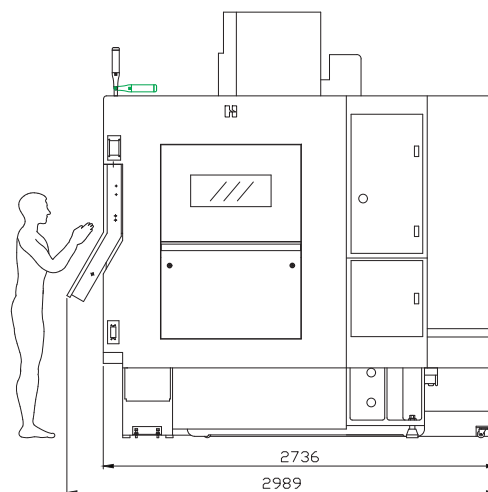
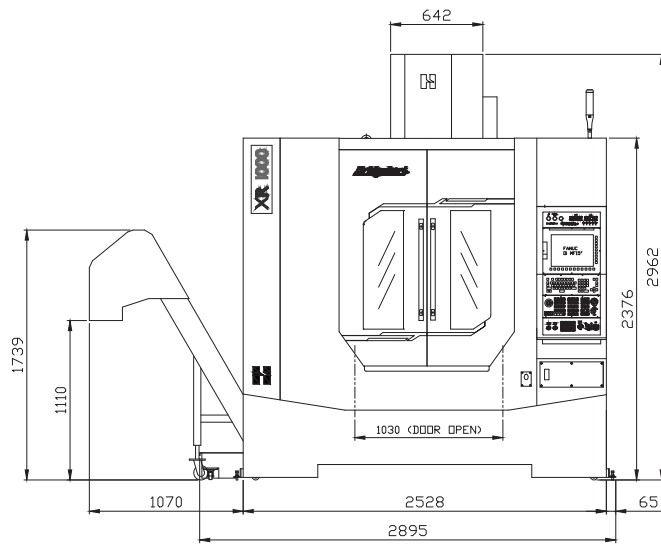
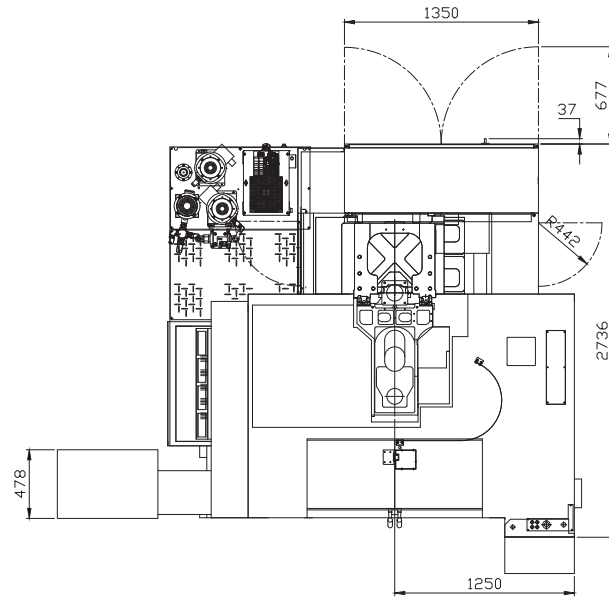


# FLOOR PLANS XR 800 APC





# FLOOR PLANS XR 1000



# SPECIFICATIONS XR 600 & XR 800 APC

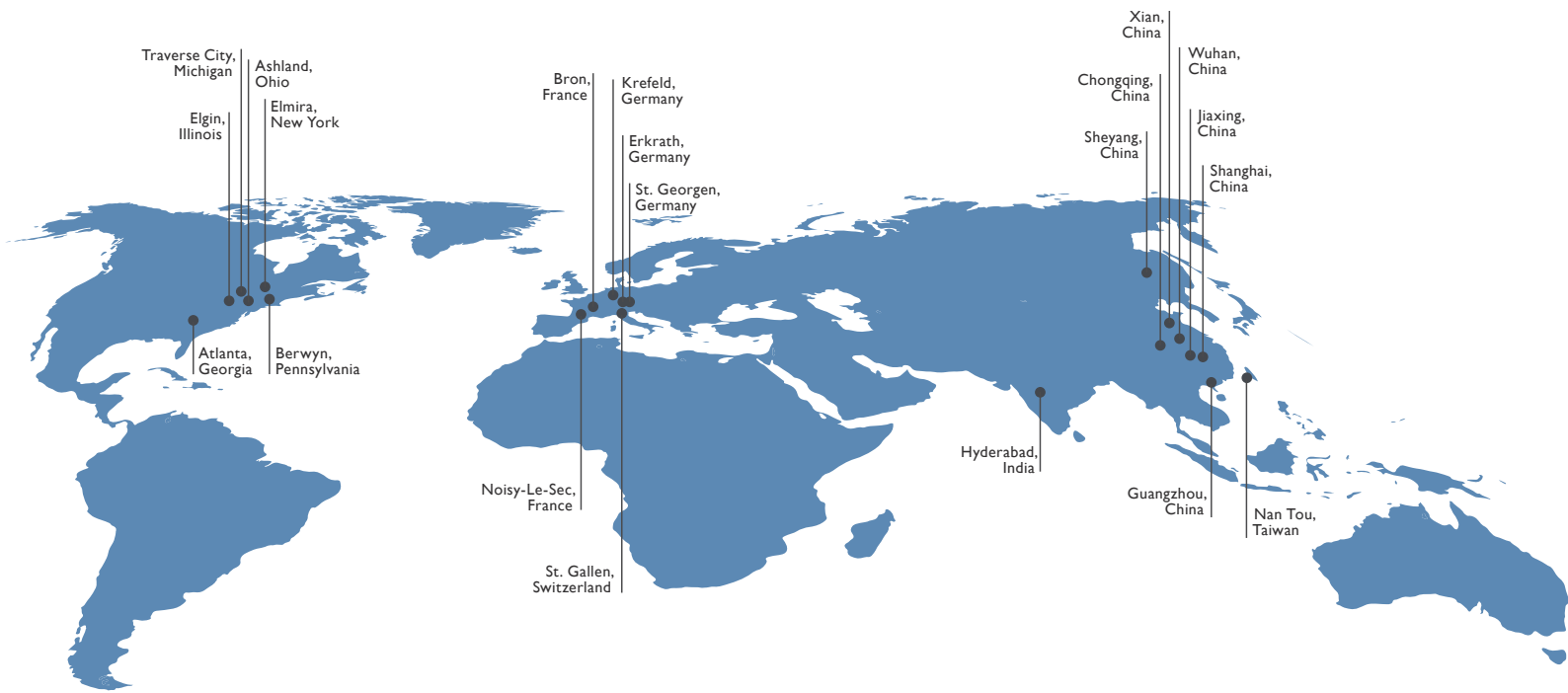
MACHINE MODEL	XR 600	XR 800 APC
Control Unit	Fanuc 0i-MF Plus 15" touch / Heidenhain TNC640	
<b>TRAVELS</b>		
X-Axis	600mm	800mm
Y-Axis	560mm	
Z-Axis	560mm	
Gage Line Height (Min-Max)	150-710mm	
Y-Axis Throat Distance	581mm	
<b>TABLE</b>		
X Length	750mm	
Y Width	560mm	
Load Capacity	700kg	
T-Slots (# & Size)	5×18mm×125mm	
<b>AUTOMATIC PALLET CHANGER (2 position, Front)</b>		
Table Length	850	
Table Width	500	
Table Max. Load (Each Table)	300kg x 2	
Clamping Force	36000N	
Table (Screw Type)	5×18mm×100mm	
APC Change Time	11±1 sec	
APC Change Type (2 Table)	Turn Table	
<b>SPINDLE TRANSMISSION</b>		
Taper ISO No.	ISO 40	
Max. Spindle Speed (RPM)	12000 (STD) / 15000 (OPT)	
Lubrication	Grease (STD) / (OPT)	
Transmission	DDS	
Spindle Motor	Fanuc 12K	Heidenhain 12K
12K Main Motor Horse Power	FANUC AiiT12/12000 11kw(S1) / 15 kw (S3 60%) / 18.5kw(S3 25%)	QAN 260MH /12000rpm 15KW(Cont.)/ 20KW (S6-60%)/ 25KW (S6-40%)/ 32KW (S6-25%)
12K Maximum Torque at Base Speed	70(S1) / 95.4(S3 60%) / 118(S3-25%) Base speed 1500rpm	95.5 N-m(Cont.)/ 127.3N-m(S6-60%)/ 159.2 N-m(S6-40%)/ 203.7 N-m(S6-25%) Base speed 1500rpm
Spindle Bearing Protection	Air Purge	
Tapping Speed (Max. RPM)	3000rpm	
Spindle taper cleaning	Air blast	
<b>DRAW BAR</b>		
Actuation	Pneumatic	
Clamp force	900kg	
Clamp method	Helical Disk Springs	
<b>AUTOMATIC TOOL CHANGER (APC)</b>		
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)	75 mm	
Max. Tool Diameter (Adj. Pockets Empty)	150 mm	
Maximum Tool Length	300 mm	
Maximum Tool Weight	7 Kg	
Tool Change Time ( T-T )	1.3~1.5 Sec	
Tool Change Time (C-C) ISO10791-9	3~3.5 Sec	
APC Transmission	Cam	

MACHINE MODEL	XR 600	XR 800 APC
<b>AXES DRIVES</b>		
X axes servo motors	AiS 22/4000 rpm, 4.5kw/22Nm	
Y axes servo motors	AiS 22/4000 rpm), 4.5kw/22Nm	
Z axes servo motors With Brake	AiS 22/4000 rpm), 4.5kw/22Nm	
<b>BALL SCREWS</b>		
Ball Screw Size/Support	Fixed pre-tensioned	
X-Axis	45mm	
Y-Axis	45mm	
Z-Axis	45mm	
Double Nut (Ball Nut)	STD	
Lubrication	Automatic Centralized Lubrication Grease	
Ball Screw Pitch (X/Y/Z)	12mm	
<b>LINEAR GUIDEWAY</b>		
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	
<b>ACCURACY</b>		
ISO 230-2 2σ		
Positioning X, Y, Z (with scale)	0.004 mm	
Repeatability X, Y, Z (with scale)	0.003 mm	
Positioning X, Y, Z (without scale)	0.009mm	
Repeatability X, Y, Z (without scale)	0.004mm	
<b>GENERAL SPECIFICATIONS</b>		
Machine Weight	6500 kg	8500 kg
Machine Overall Width(Chip conveyor not included)	2726mm	2726mm
Machine Overall Height	2941	3320
Machine Overall Depth (Chip conveyor not included)	3419	3975
Front Door opening	940	940
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/cm² minimum	
Power Requirements (FLA/VOLTS/PHASE)	89 amp / 220 volt / 3 phase	
Distance floor to surface of table	917 mm	1081 mm

# SPECIFICATIONS XR 1000

<b>AXIS TRAVEL</b>	
Table (X Axis)	1020 mm
Saddle (Y Axis)	610 mm
Head (Z Axis)	610 mm
Table Surface to Spindle Gauge Plane Distance (Min to Max)	100 to 710 mm
<b>POSITIONING</b>	
Auto Mode (X and Y Axis)	48 m/mm
Auto Mode (Z Axis)	36 m/mm
Feedrate Range (X and Y Axis)	.0025 - 20 m/mm
Feedrate Range (Z Axis)	.0025 - 20 m/mm
Minimum Increment	.001 mm
Ball Screw Dia. and Pitch (X and Y Axis)	45 x 16 mm
Z Axis	45 x 12 mm
Spindle	12,000 rpm (DDS)
FANUC- Motor Power	15 kW(cont.)
Maximum Torque at Base Speed	28.6N-m(cont.,High-speed winding) 95.5N-m (cont.,Low-speed winding)
Spindle Taper	NO.40
Tool Holder	CT40 or BT40 or DIN40
<b>WORKTABLE</b>	
Working Surface	1300 x 600 mm
Table Load	900 kg
Number of T-Slots	5
T-Slot Size	18 mm
T-Slot Center Dimension	100 mm
<b>AUTOMATIC TOOL CHANGER</b>	
Magazine Capacity	30 Tools
Tool Select by Shortest Path and Random Select	Bi-Directional
Max. Tool Diameter	150 mm
(adjacent pocket)	75 mm
Max. Tool Length	300 mm
Max. Tool Weight	7 kg
<b>COOLANT AND CHIP MANGEMENT</b>	
Chip Removal	Chip Conveyor
Coolant Tank Capacity	385
Wash Down	Standard
Wash Gun	Standard
Stainless Chip Pan	Standard
Cutter Air Blaster	Standard
Through Spindle Coolant	Standard
<b>ACCURACY - ISO 230-2</b>	
Positioning - A	0.010 mm
Repeatability - R	0.005 mm
<b>LINEAR SCALE OPTION</b>	
Positioning	0.005 mm
Repeatability	0.004 mm
<b>MACHINE SIZE</b>	
Machine Dimensions (WxD)	2528 x 3043 mm
Height	2921 mm
Mass of Machine	7000 kg (30T)
<b>INSTALLATION SPECIFICATIONS</b>	
Electrical Supply (Input)—Balanced 3-Phase	50 or 60 Hz
Power	25 KVA
Voltage <sup>2</sup>	208 - 230 or 380 - 440 Volt
Compressed Air (Pressure / Flow)	4.9 cfm
Coolant Flow Rate at Cutter	160 L/min
Through Spindle Coolant Pressure	20 bar (Std)
Washdown	140 L/min

# 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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