

### CNC Precision Engineering

**A&M offers precision high speed 3, 4 and 5 axis machining and the latest generation of EDM wire cutting and spark erosion.**

A&M's policy is to work with tried and tested equipment suppliers, enabling us to operate a full range of machines with similar control systems, providing operational flexibility.

Our HURCO CNC machines range from compact 3 axis machines to large capacity 5 axis machines, enabling us to programme multiple operations and run work as 'lock and load', with the unmanned and 'lights out' operation overnight and at weekends using optimised speeds. We have invested in shrink fit tooling, to reduce vibration and extend tool life.

<u>CNC Millers</u>	<u>X/Y/Z axis</u>	<u>Manufacturer details</u>
<b><u>3 Axis</u></b>		
HURCO DCX22 40T	2200 x 1700 x 750 mm	<a href="http://www.hurco.com/en-gb/machine-tools/machining-centres/vertical/pages/double-column.aspx">http://www.hurco.com/en-gb/machine-tools/machining-centres/vertical/pages/double-column.aspx</a>
HURCO DCX32 50T (x2)	3200 x 2100 x 920 mm	
HURCO VM1	660 x 356 x 457 mm	
HURCO VM10i	660 x 406 x 508 mm	
HURCO VM3	1320 x 457 x 457 mm	
HURCO VMX 30S	762 x 508 x 610 mm	
HURCO VMX 42 (x3)	1066 x 610 x 610 mm	
HURCO VMX 84Ti	2134 x 864 x 762 mm	
Sodick HS430L	420 x 350 x 200 mm	
<b><u>4 Axis</u></b>		
HURCO VM3	1200 x 450 x 450 mm	
<b><u>5 Axis</u></b>		
HURCO VM10U	530 x 400 x 480 mm	<a href="http://www.hurco.com/en-gb/machine-tools/machining-centres/vertical/pages/performance.aspx">http://www.hurco.com/en-gb/machine-tools/machining-centres/vertical/pages/performance.aspx</a>
HURCO VMX 30U	762 x 508 x 610 mm	
HURCO VMX 60SR	2134 x 864 x 762 mm	

<u>CNC Lathes</u>	X/Y/Z axis	Manufacturer details
<b>HURCO TM6 VDi</b>	178 x 356 mm	<a href="http://www.hurco.com/en-gb/machine-tools/machining-centres/5-axis-vertical/pages/swivel-head.aspx">http://www.hurco.com/en-gb/machine-tools/machining-centres/5-axis-vertical/pages/swivel-head.aspx</a>
<b>HURCO TM8</b>	203 x 508 mm	
<b>HURCO TM8H VDi</b>	203 x 508 mm	
<b>HURCO TMM10</b>	250 x 750 mm	
<b>HURCO TM10 VDi</b>	250 x 750 mm	
<b>HURCO VMX60SRTi</b>	1,524 x 660 x 610 mm	

<u>Conventional Turning</u>	X/Y/Z axis	Manufacturer details
<b>XYZ Proturn SLX 555</b>	500 x 200 mm	<a href="http://www.xyzmachinetools.com/">http://www.xyzmachinetools.com/</a>
<b>XYZ Proturn 1630</b>	1000 x 420 mm	
<b>XYZ Manual turner</b>	500 x 200 mm	

<u>Manual Millers</u>	X/Y/Z axis	Manufacturer details
<b>XYZ 1500</b>	570 x 275 mm	<a href="http://www.xyzmachinetools.com/">http://www.xyzmachinetools.com/</a>
<b>XYZ 2000 manual</b>	740 x 380 x 406 mm	
<b>XYZ EMX 2000</b> Part CNC Pro trac manual miller	740 x 380 mm	
<b>XYZ EMX 3000</b> Part CNC Pro trac manual miller	770 x 387 x 550 mm	

## Wire and Spark Erosion

**Our comprehensive range of Sodick wire erosion machines includes some of the largest machines in the UK, enabling us to schedule work flexibly to achieve rapid turnaround times.**

Many of our machines incorporate the latest four axis linear motor technology to meet the most demanding requirements for surface finish and accuracy.

<b><u>Sodick Wire Erosion</u></b>	<b>X/Y/Z axis</b>	<b>Manufacturer details</b>
<b>A325</b>	350 x 250 x 220 mm	
<b>AG600L (x4)</b>	700 x 500 x 400 mm	<a href="http://www.sodick.org/products/precision-wire-edm/ag600l.html">http://www.sodick.org/products/precision-wire-edm/ag600l.html</a>
<b>ALC 600G (x4)</b>	600x 400 x 350 mm	<a href="http://www.sodick.org/products/precision-wire-edm/alc600g.html">http://www.sodick.org/products/precision-wire-edm/alc600g.html</a>
<b>AQ325L (x2)</b>	350 x 250 x 220 mm	
<b>AQ537 (x2)</b>	750 x 500 x 400 mm	
<b>AQ750L</b>	750 x 500 x 400 mm	<a href="https://www.sodick.com/products/wire-edm/aq750l">https://www.sodick.com/products/wire-edm/aq750l</a>
<b>AQ750 Premium (x2)</b>	600 x 400 x 300 mm	<a href="http://www.sodick.org/products/precision-wire-edm/aq750l-premium.html">http://www.sodick.org/products/precision-wire-edm/aq750l-premium.html</a>
<b>AQ900L Premium</b>	900 x 600 x 400 mm	<a href="https://www.sodick.com/products/wire-edm/aq900l">https://www.sodick.com/products/wire-edm/aq900l</a>
<b>AQ1200L</b>	1200 x 800 x 400 mm	<a href="https://www.sodick.com/products/wire-edm/aq1200l">https://www.sodick.com/products/wire-edm/aq1200l</a>
<b>EPOC 1100</b>	1100 x 700 x 350 mm	

**Our spark erosion capabilities enable us to machine intricate details to very tight tolerances on a wide range of metal and composite materials.**

<b><u>Sodick Spark Erosion</u></b>	<b>X/Y/Z axis travel</b>	<b>Manufacturer details</b>
<b>AG60L (x2)</b>	600 x 420 x 370 mm	<a href="http://www.sodick.org/products/die-sinking-edm/ag60l.html">http://www.sodick.org/products/die-sinking-edm/ag60l.html</a>
<b>AG80L</b>	850x 520 x 420 mm	<a href="http://www.sodick.org/products/die-sinking-edm/ag80l.html">http://www.sodick.org/products/die-sinking-edm/ag80l.html</a>
<b>AG100L</b>	1200 x 650 x 500 mm	<a href="http://www.sodick.org/products/die-sinking-edm/ag100l.html">http://www.sodick.org/products/die-sinking-edm/ag100l.html</a>
<b>AQ35</b>	350 x 250 x 270 mm	<a href="http://www.sodick.org/products/die-sinking-edm/ad35l.html">http://www.sodick.org/products/die-sinking-edm/ad35l.html</a>
<b>AM35 Linear</b>	350 x 250 x 270 mm	
<b><u>EDM Hole Drilling</u></b>		
<b>K1C hybrid</b>	200 x 300 x 300 mm	<a href="http://www.sodick.org/products/hole-drilling-edm/k1c.html">http://www.sodick.org/products/hole-drilling-edm/k1c.html</a>
<b>K1C CNC</b>	200 x 300 x 300 mm	
<b>K1C (x2)</b>	200 x 300 x 300 mm	

## Metrology and Quality inspection

**Quality assurance and quality control are critical to our manufacturing process.**

We have invested £500,000 in a climate-controlled metrology room and testing equipment to ensure we consistently manufacture to the tight tolerances our OEM customers require.

<u>Metrology measurement</u> <u>Coordinate Measuring Machines (CMM)</u>	<u>Capacity</u>
Hexagon Global Performance 12.30.10 with Leitz scanning head Technology	1200 x 3000 x 1000 mm
IMS Merlin	1000 x 2500 x 750 mm
Aberlink Axiom Too	600 x 1000 x 400 mm

### Quality Inspection & Testing equipment

3D Laser scanner - HandySCAN 700 3D <https://emco.co.uk/handyscan-700/>

Analyser - Hitachi Vulcan handheld XRF LIBS (laser induced breakdown) analyser  
<https://hha.hitachi-hightech.com/en/product-range/products/handheld-xrf-libs-analysers/handheld-libs-analysers>

Digital Bore Micrometres - Mahr, Mititoyo

Digital Imagery Measurement for small and delicate parts - Project X, Aberlink

Dynamic Balancing Machine to less than 1g.mm

Dynamometer - Land and Sea DYNO-mite C 50 hp, eddy-current brake

Dynascopes - Vision Engineering, Digimax DX1 Micro Height

Hardness testing equipment - Zwick Roell ZMU

Injector Tester and ultra-sonic cleaner – ASNU

Micro height gauge - Sylvac Hi-Cal 300

Microscopes - Mantis Elite, Photonic PL2000

**Renishaw XL-80 laser calibration & software**

<http://www.renishaw.com/en/xl-80-laser-system--8268>

**Shadowgraphs - Mititoyo PH3500, Starrett 400**

**Surface Testers - Mititoyo S-400, Mititoyo SJ400**

**Non-Destructive Testing (NDT) undertaken by registered approved supplier.**

**Welding**

**Laser**

**Rofin Integral**

**Rofin Select**

**Rofin Star Laser Weld Tool Open**

Spot welds using a galvo head to deflect the beam, and seam welds using overlapping spots or with a continuous beam.

**Manual**

**Mig, Tig and Arc welders**

Standalone portable system, enabling us to deliver laser welding at a customer's site.

**Other equipment**

**Cranes – 4 cranes up to 10 tonnes**

**Cylindrical Grinders x 9**

**Deburring – TFM 83/37 Walther Trowal vibratory finishing machine, cleaning trough**

**Drills – Pedestal drills x 3, Radial drills x 2**

**Part Marking – Dot matrix, Laser, Chemical**

**Power Saws – 3x horizontal, 1 band saw**

**Sheet Metal Cutter – Bayleigh**

**Shot Blasters – dry and wet**

**Surface Grinders – 8 grinders, up to 1000 x 500 x 400**

**Try out Press – up to 150 tonnes**

**Ultrasonic cleaners – EMX 2000 & 3000, manual MCS**

## **CAD software**

### **Autodesk PowerMill Ultimate 2018**

- **Blisk Machine**
- **Five Axis**
- **Machining**

### **Autodesk PowerShape Premium 2018**

### **EZ EDM**

### **GearTrax - gear, spline, sprocket and pulley modelling mathematical software**

### **Solidworks Premium with Finite Element Analysis**

### **Vero PEPS Wire EDM CAM**