

### CNC Precision Engineering

**A&M offer precision high speed CNC machining and the latest generation of EDM wire cutting and spark erosion.** Our policy is to work with tried and tested equipment suppliers, enabling us to operate a full range of machines with similar control systems, giving us operational flexibility.

Our HURCO CNC machines range from compact to large capacity 5 axis machines, enabling us to programme multiple operations and run 'lock and load' unmanned operations. 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/documents/europe-hurco-imachining-centers.pdf">http://www.hurco.com/en-gb/machine-tools/documents/europe-hurco-imachining-centers.pdf</a>
HURCO DCX32 50T (x2)	3200 x 2100 x 920 mm	
HURCO VM 1	660 x 356 x 457 mm	
HURCO VM 10i	660 x 406 x 508 mm	
HURCO VM 30i	762 x 508 x 610 mm	
HURCO VMX 30S	762 x 508 x 610 mm	
HURCO VMX 84Ti	2134 x 860 x 760 mm	
Sodick HS4 30L	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 VM 10 U	530 x 400 x 480 mm	<a href="https://www.hurco.com/en-gb/machine-tools/our-control/Documents/17788_5-AxisBrochure_WEB.pdf">https://www.hurco.com/en-gb/machine-tools/our-control/Documents/17788_5-AxisBrochure WEB.pdf</a>
HURCO VMX 30 U	762 x 508 x 610 mm	
HURCO VMX 42Ui (x4)	1066 x 610 x 610 mm	
HURCO VMX 60 SR	1524 x 660 x 610 mm	
HURCO VMX 60 SRTi	1524 x 660 x 610 mm	

<u>CNC Lathes</u>	X/Y/Z axis	Manufacturer details
<b>HURCO TM6 VDi</b>	178 x 356 mm	<a href="https://www.hurco.com/en-gb/machine-tools/Documents/Europe-Hurco-iTurning-Centres.pdf">https://www.hurco.com/en-gb/machine-tools/Documents/Europe-Hurco-iTurning-Centres.pdf</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	

<u>Conventional Turning</u>	X/Y/Z axis	Manufacturer details
<b>XYZ Protturn SLX 555</b>	500 x 200 mm	<a href="http://www.xyzmachinetools.com/">http://www.xyzmachinetools.com/</a>
<b>XYZ Protturn 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>	660 x 305 x 406 mm	<a href="http://www.xyzmachinetools.com/">http://www.xyzmachinetools.com/</a>
<b>XYZ 2000</b>	750 x 380 x 406 mm	
<b>XYZ EMX 2000</b> Part CNC Pro trac manual miller	750 x 380 x 406 mm	
<b>XYZ EMX 3000 Turret</b> Part CNC Pro trac manual miller	810 x 430 x 406 mm	
<b>Bridgeport Manual</b> milling machine		

## **Electrical Discharge Machining (EDM)**

### **EDM Spark Erosion**

**Spark erosion EDM is used to machine complex materials, shapes and sizes with complete precision that cannot be achieved with CNC or manual milling and turning.**

Spark EDM is a controlled metal-removal process, used to remove metal by means of electric spark erosion. In this process an electric spark is used as the cutting tool to cut (erode) the workpiece to produce the finished part to the desired shape.

A&M use Sodick Spark eroders with linear motor technology to deliver high speeds, repeatability and accuracy.

<b><u>Sodick Spark Eroders</u></b>	<b>X/Y/Z axis travel</b>	<b>Manufacturer details</b>
<b>AM35L</b>	350 x 250 x 270 mm	
<b>AQ35</b>	350 x 250 x 270 mm	
<b>AG60L (x 4)</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>	850 x 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><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 (x 2)</b>	200 x 300 x 300 mm	

## EDM Wire Erosion

In Wire-Cut EDM, a thin single-strand metal wire is fed through the work piece, which is in a submerged tank of dielectric fluid or deionized water. This fluid helps to cool the process and flush away the cut material. The Wire EDM process uses electric current to cut conductive materials leaving a smooth surface that requires no further finishing or polishing.

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

<u>Sodick Wire Eroders</u>	<u>X/Y/Z axis</u>	<u>Manufacturer details</u>
<b>A325</b>	350 x 250 x 220 mm	
<b>AG600L (x 4)</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 (x 4)</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 (x 2)</b>	350 x 250 x 220 mm	
<b>AQ537 (x 2)</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>AQ750L Premium (x 2)</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	

## Metrology and Quality inspection

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

We have a climate-controlled metrology room and testing equipment to ensure we consistently manufacture to the micron specific tolerances our OEM customers require.

<u>Metrology measurement</u> <u>Coordinate Measuring Machines (CMM)</u>	Capacity
Hexagon Global Performance 12.30.10 with Leitz scanning head Technology <a href="https://www.hexagonmi.com/products/coordinate-measuring-machines/bridge-cmms/global-s">https://www.hexagonmi.com/products/coordinate-measuring-machines/bridge-cmms/global-s</a>	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 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** <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**

We have a dedicated welding bay and bespoke table

**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.

<https://www.rofin.com/en/products/systems-and-solutions/manual-welding-lasers/performance/>

**Manual**

**Mig, Tig and Arc welders**

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

**Other equipment**

**Bandsaw – vertical, Addison V2812** <https://addisonsaws.co.uk/products/addison-jubilee-v2812-f-h>

**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**

**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**

## **3D Printing**

**Form 2 SLA 3D Printer** <https://formlabs.com/store/uk/form-2/>