

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>
3 Axis		
HURCO DCX22 40T	2200 x 1700 x 750 mm	http://www.hurco.com/en-gb/machine-tools/documents/europe-hurco-imachining-centers.pdf
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 42 (x 3)	1066 x 610 x 610 mm	
HURCO VMX 84Ti	2134 x 860 x 760 mm	
Sodick HS4 30L	420 x 350 x 200 mm	
4 Axis		
HURCO VM3	1200 x 450 x 450 mm	
5 Axis		
HURCO VM 10 U	530 x 400 x 480 mm	https://www.hurco.com/en-gb/machine-tools/our-control/Documents/17788_5-AxisBrochure WEB.pdf
HURCO VMX 30 U	762 x 508 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
HURCO TM6 VDi	178 x 356 mm	https://www.hurco.com/en-gb/machine-tools/Documents/Europe-Hurco-iTurning-Centres.pdf
HURCO TM8	203 x 508 mm	
HURCO TM8H VDi	203 x 508 mm	
HURCO TMM10	250 x 750 mm	
HURCO TM10 VDi	250 x 750 mm	

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

<u>Manual Millers</u>	X/Y/Z axis	Manufacturer details
XYZ 1500	660 x 305 x 406 mm	http://www.xyzmachinetools.com/
XYZ 2000	750 x 380 x 406 mm	
XYZ EMX 2000 Part CNC Pro trac manual miller	750 x 380 x 406 mm	
XYZ EMX 3000 Turret Part CNC Pro trac manual miller	810 x 430 x 406 mm	

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.

<u>Sodick Spark Eroders</u>	X/Y/Z axis travel	Manufacturer details
AM35L	350 x 250 x 270 mm	
AQ35	350 x 250 x 270 mm	
AG60L (x 4)	600 x 420 x 370 mm	http://www.sodick.org/products/die-sinking-edm/ag60l.html
AG80L	850 x 520 x 420 mm	http://www.sodick.org/products/die-sinking-edm/ag80l.html
AG100L	1200 x 650 x 500 mm	http://www.sodick.org/products/die-sinking-edm/ag100l.html
<u>EDM Hole Drilling</u>		
K1C hybrid	200 x 300 x 300 mm	http://www.sodick.org/products/hole-drilling-edm/k1c.html
K1C CNC	200 x 300 x 300 mm	
K1C (x 2)	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>
A325	350 x 250 x 220 mm	
AG600L (x 4)	700 x 500 x 400 mm	http://www.sodick.org/products/precision-wire-edm/ag600l.html
ALC 600G (x 4)	600x 400 x 350 mm	http://www.sodick.org/products/precision-wire-edm/alc600g.html
AQ325L (x 2)	350 x 250 x 220 mm	
AQ537 (x 2)	750 x 500 x 400 mm	
AQ750L	750 x 500 x 400 mm	https://www.sodick.com/products/wire-edm/aq750l
AQ750L Premium (x 2)	600 x 400 x 300 mm	http://www.sodick.org/products/precision-wire-edm/aq750l-premium.html
AQ900L Premium	900 x 600 x 400 mm	https://www.sodick.com/products/wire-edm/aq900l
AQ1200L	1200 x 800 x 400 mm	https://www.sodick.com/products/wire-edm/aq1200l
EPOC 1100	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	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.

<u>Welding</u>	We have a dedicated welding bay and bespoke table
<u>Laser</u> 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.
<u>Manual</u> 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

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