ABERLINK
Innovative Metrology

AXIOMTOO

Evolution in CMM technology

Introducing the Axiom too range of manual and CNC CMM's

The Complete Inspection Centre

Axiom too …… the next generation

When the original Axiom CMM was released in 1997 it revolutionised CMM design utilising extremely innovative CMM technology. The Axiom was hugely successful but now Aberlink have taken all the best features from the original model and improved upon them. The Axiom too offers a larger measurement volume and higher accuracy than it's predecessor, incorporating the very latest in materials technology.

The Axiom too comes in four different sizes, can be manual or CNC and, in addition, for those companies who are not sure whether they require a manual or CNC machine, or perhaps couldn't initially justify a CNC machine, the Axiom too manual machine is easily upgradable to CNC at any point in the future.

So what features make the Axiom too so outstanding? Well, it's all aluminium bridge structure ensures that if the CMM is not housed in a temperature controlled environment, the machine will expand and contract uniformly with temperature fluctuations ensuring no distortion or subsequent errors. Ambient temperature can be compensated for in the user software making it ideal for use on the shop floor.

The latest high-tech granite and honeycomb aluminium table provides natural damping and will support components up to 300kg. Also, the granite Y beam allows preloading of the bridge air bearings in both directions for superior accuracy.

The Axiom too is supplied as a complete package that includes not only the machine, but also the PC and peripherals, the Aberlink 3D measurement software, a Renishaw probe, styli, a reference sphere and mist filters. It is installed, calibrated and training is included.

How can we make such a fantastic machine so competitively? Simple: Aberlink pride themselves on designing for manufacture. We have complete control over all aspects of manufacturing the CMMs, from machining of the parts to writing of the software. The result is a design that is not only robust and functional, but also simple to make….. and a knock on of simplicity is reliability.

Air Bearings

Air bearings of optimised stiffness are employed on all axes. Friction free bearings mean that axes never wear.

All Aluminium Construction

Industry standard, all aluminium construction results in low inertia and low thermal mass, ideal for use in less than perfect environments.

Complete Metrology Package

Aberlink supplies a complete 'Turn Key' package including controller, software, probe and training.
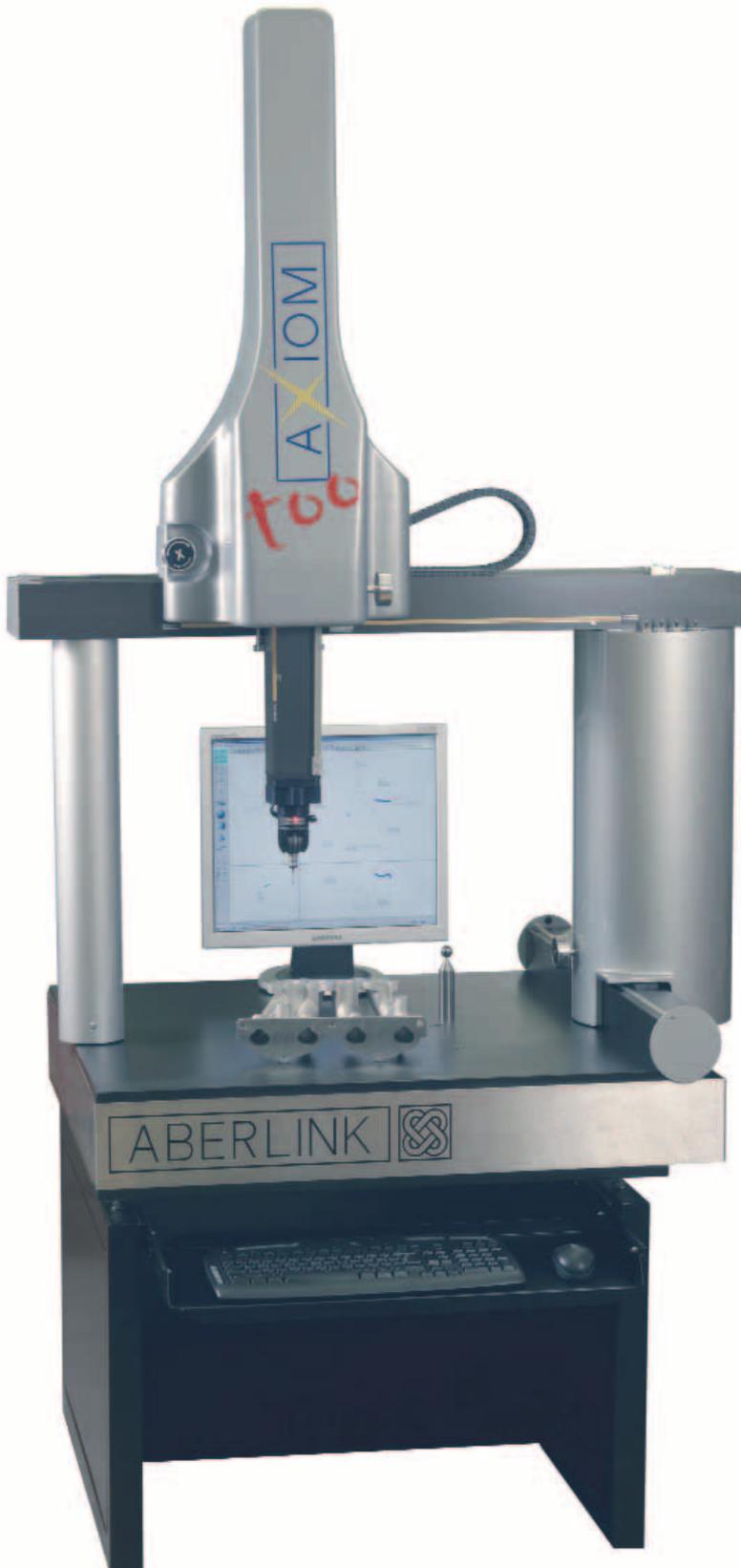

High Speed Adjustment

Because of optimised fine adjustment on the manual variant machines, hand wheels are left engaged, encouraging good metrology techniques. The friction can be adjusted to suit the user.

The Axiom too really is the ultimate CMM

Axiom too …… the advantages are clear

Large Measurement Volume

X-axis 640mm
Y-axis 600, 900, 1200, or 1500mm
Z-axis 500mm
Available in **both** manual and CNC formats.

Compact Design

The controller and peripherals can all be housed within the Axiom too workbench for minimum footprint.

Granite Y Beam

Allows pre-loading of bridge bearings in both directions for increased accuracy.

Reliability

The robust design of the Axiom too has been developed for use on the shop floor, and is based on the proven record of the original Axiom over the last decade.

Latest high-tech Materials

Granite and honeycomb aluminium structure provides natural damping.

Upgrade from manual to CNC

A CNC upgrade kit is available to simply convert manual CMMs to CNC.

Accuracy

Very high measurement accuracy is achieved through the latest metrology and manufacturing methods.

Aberlink 3D Software

Aberlink 3D …… making 3D measurement as easy as it can be

Aberlink 3D Software is the very latest geometric measurement software designed around a graphical interface, not just with graphics added on. Aberlink 3D can be used either on manual or CNC machines, can be configured for use in either 2-dimensions or 3-dimensions and is equally at home when used with either probing systems or vision.

The user software is revolutionary, as it builds up a picture of the component being inspected on the computer screen. Dimensions can be 'picked off' the picture in a way that corresponds directly to the way the component has been dimensioned on the drawing.
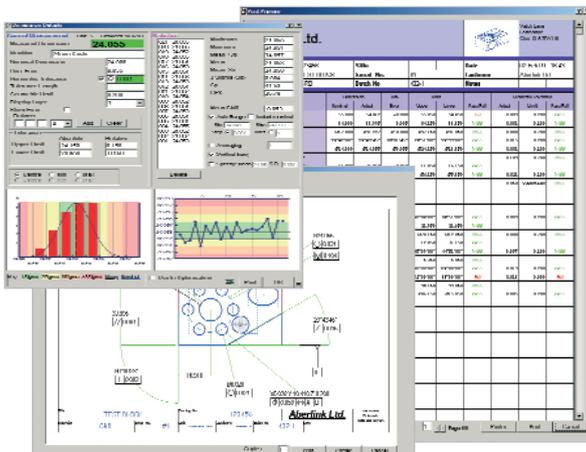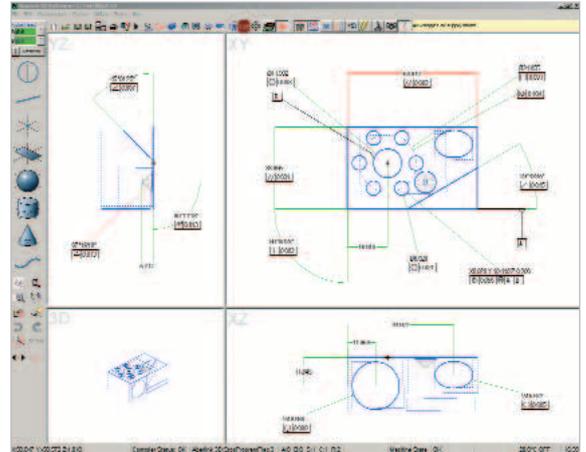

Inspection reports can be in the form of fully dimensioned graphical representations as created on the screen, or tabulated reports in various formats that can show nominals, tolerances, errors, pass/fails, geometric tolerances etc. These reports can also be output to an Excel spreadsheet.

Further reports are available to show the form of features (roundness, straightness etc.), hole or point positions, or complete batch results on one report.

The User's company name also appears on all output.

Every time a component is inspected, a program for measuring subsequent components is automatically created. The software automatically calculates 'safe' moves between features, even when the probe is indexing – just another thing that the operator doesn't have to worry about!

Aberlink 3D software is not only way ahead of it's competition in being the industry standard for 'Easy to Use' software, but also has the depth of functionality to make it the choice for either occasional users or full time inspection professionals.
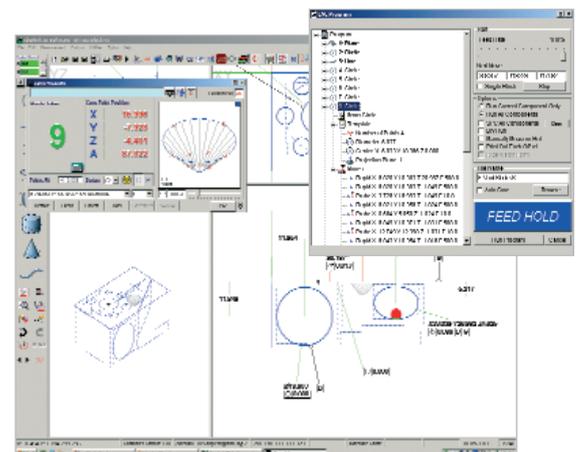
Aberlink CAD Comparison Module

…… sometimes measuring against a CAD model is the only solution

Aberlink 3D geometric measurement software has become the industry standard, easy-to-use software when geometric features need to be measured against a drawing. However, sometimes components also contain complex surfaces, or may be conventional drawings for a component simply don't exist. In this situation the only way to inspect a part may be against it's CAD model.

Aberlink's CAD comparison module allows users of the Aberlink 3D software to import a solid model from CAD in either a STEP or an IGES format, and then take measurements using the CAD model as master data. This can be done on either a manual CMM or in full CNC mode.
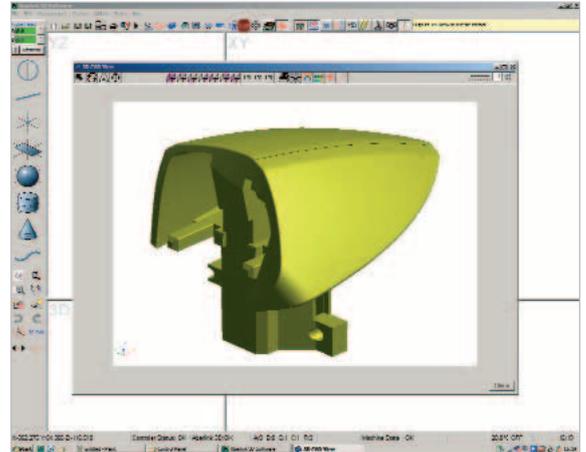
The solid model appears in an additional floating window on top of the main Aberlink 3D screen.

Alignment of the part to the CAD model can be done in a number of ways using either geometric features, or by best-fitting through measured points on the component's surface, or by a combination of both methods.

Any points taken in a measured feature will now appear in the CAD window. These points will be displayed as a colour-coded dot on the model, and can either have a line leading to a box showing the error of the measured point, or alternatively the length of the attached line can be proportional to the error. In this way it is easy to visualise the distortion of a surface relative to the theoretical model.
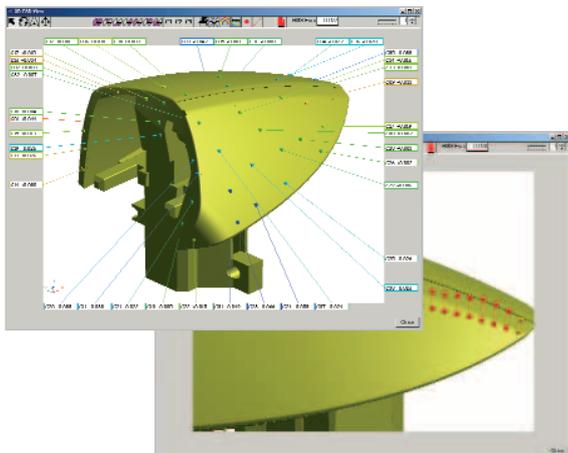
The best-fit function allows full 3D re-alignment of the model in order to minimise the RMS errors of any set of measured points within a curve unit.

Reports can be prepared at the click of a mouse button and can be either graphical, in a tabulated format, or printed as a combination of both. Reports can be built up from multiple features or multiple inspections, which can be printed from within the Aberlink software or alternatively exported as an Excel file.
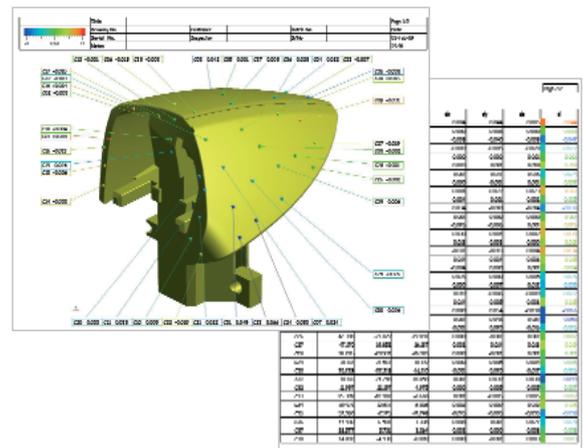
Aberlink Camera System

Non-contact measuring on a CMM

Aberlink's Camera System offers a non-contact facility on any Aberlink CMM. A clever design of magnetic, kinematic joint allows the probe and camera to be swapped in just seconds. This means that components can be inspected using both touch trigger and vision inspection technology within the same measurement program.

The camera incorporates a telecentric lens, which gives distortion-free images on the monitor. The lens has a manual adjustment that will permit working focal lengths up to 400mm, with a field of view up to 35mm.

Full automatic edge detection tools are available within the Aberlink 3D measurement software, which allow the camera to be used either in manual or CNC mode – please see opposite for a description of the vision software available from Aberlink.


The camera also incorporates a fully programmable 16 LED light ring, which contains alternate white and UV LEDs. The white LEDs provide surface illumination, in the normal manner, whilst the UV LEDs provide an ingenious solution to the perennial problem of backlighting on a CMM: The component to be measured is placed on a plate containing a special reflective paper.

When illuminated with UV light, any light striking the surface of the component is reflected and because it is UV, it is invisible to the camera. However, any light which passes by the component and strikes the reflective paper fluoresces and therefore becomes visible. The effect of this is that an extremely sharp silhouette of the component is produced because it has now been lit from underneath.

This ingenious new invention not only negates the need for the previously used cumbersome light boxes, but also provides a fully controllable backlight source, which can easily be used over the whole bed of a CMM. The fact that it is controllable in software is especially useful on CNC machines, when the user will often need to automatically switch between top and backlighting on a single component.

Just another example of Aberlink's innovative approach to solving metrology problems!
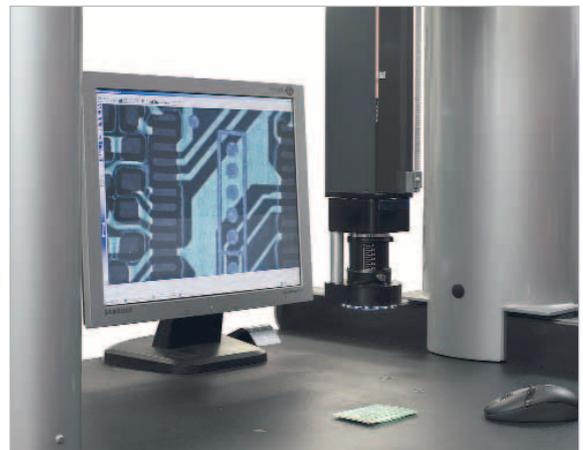
Aberlink Vision Software

Powerful vision tools …… yet so easy to use

Aberlink's Vision Module allows the Aberlink 3D measurement software to be used not only on touch-trigger CMMs, but also with a camera system, to provide non-contact measurement under either manual or fully automatic CNC control.

The camera icon will open an additional window showing the image of the camera. Measurements can then be performed using the camera image, including a full range of automatic edge detection tools, which will ensure fast and repeatable results without relying on the skill of the operator.
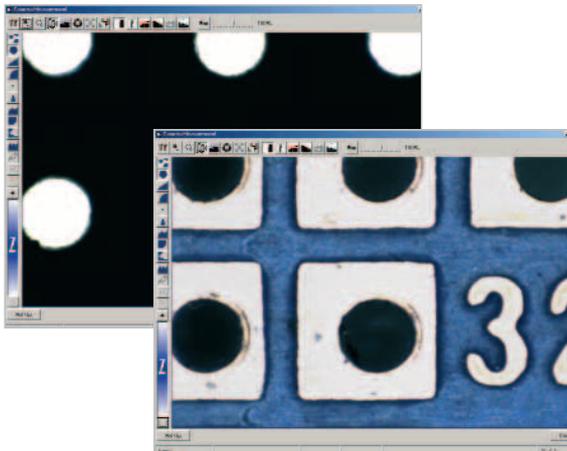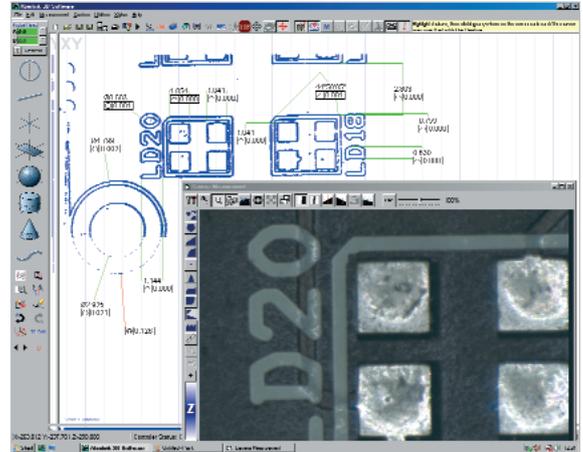
The lighting panel offers software control for surface illumination, back lighting and also TTL lighting, if available. The surface illumination tool allows directional control of the lighting as well as for intensity, which is fully automatic under CNC playback.

The curve tool also allows the software to trace around the profile of components. Dimensions can then either be called up directly on the measured data, or alternatively geometric features can be constructed through the points, or even a DXF file of the part can be imported and the data best-fitted to the file to view the actual measured shape.

Control of the Z axis and auto-focus is also available under software control.

Other standard measurement tools include lines, arcs, circles, points, peak points and automatic shape recognition. Measurements can be performed using edge detection, or centre line detection, or by using full cross-hairs or mouse cross-hairs, and there is also a unique Smart Measure function that will take discrete measurement points by detecting an edge in the vicinity of a mouse click.

Some special tools include the 'All Edge Points' function, where every edge within the field of view will be grabbed with just a single mouse click.There is a 'Thread Measure' tool for analysing thread forms, and a 'Screen Ruler' function for when you just need a quick measurement between two points on the image.
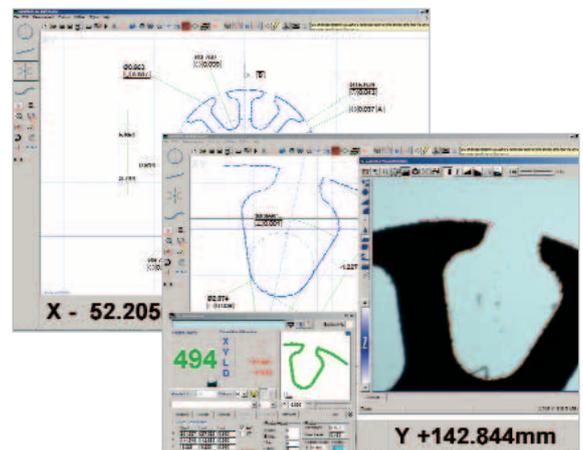
For a successful company an AXIOM too is a necessity not a luxury

- Why have expensive CNC machines waiting to be set? Speed up feedback with an Axiom too.

- Why tie up skilled personnel carrying out slow traditional inspection?

- Why lose customers because you supplied out of tolerance parts?

- Attract more profitable work with a leading edge inspection centre.

- Some features can only be accurately inspected with a CMM.

- Intuitive software for the first time user means you are seeing the benefits fast.

Inspection wastes thousands

Are you still using traditional methods of inspection, while expensive CNC machines are idle, or worse, your inspections are inaccurate or missed out completely?

Now at last with an Axiom too CMM, you can dramatically reduce inspection times and improve setting times throughout your business.

Example:

Number of CNC machines	5
Time saved in inspection and setting (per machine, per shift)	0.5 hrs
Number of shifts per day	1
Daily time saving for inspection and setting	2.5 hrs
Hourly rate	£40
Total annual inspection saving	**£25,000**

Compare this with the price of an Axiom too and pay back will be in a matter of months! This means a massive improvement in your bottom line figure thereafter - and no expensive rejects, reworks or lost customers.

Specification	Axiom too 600		Axiom too 900		Axiom too 1200	Axiom too 1500
Type	Manual	CNC	Manual	CNC	CNC	CNC
Measuring Volume	640 x 600 x 500	640 x 600 x 500	640 x 900 x 500	640 x 900 x 500	640 x 1200 x 500	640 x 1500 x 500
Table	Honeycomb aluminium & granite or solid granite	Honeycomb aluminium & granite or solid granite	Honeycomb aluminium & granite or solid granite	Honeycomb aluminium & granite or solid granite	Solid granite	Solid granite
Accuracy	B89: 0.008/300mm VDI(U3): 0.0029 + L/250	B89: 0.008/300mm VDI(U3): 0.0029 + L/250	B89: 0.008/300mm VDI(U3): 0.0029 + L/250	B89: 0.008/300mm VDI(U3): 0.0029 + L/250	B89: 0.008/300mm VDI(U3): 0.0029 + L/250	B89: 0.008/300mm VDI(U3): 0.0029 + L/250
Measuring System	Renishaw readheads and tape scale	Renishaw readheads and tape scale	Renishaw readheads and tape scale	Renishaw readheads and tape scale	Renishaw readheads and tape scale	Renishaw readheads and tape scale
Resolution	0.0005mm	0.0005mm	0.0005mm	0.0005mm	0.0005mm	0.0005mm
Probe System	Full choice of Renishaw probes and probe heads	Full choice of Renishaw probes and probe heads	Full choice of Renishaw probes and probe heads	Full choice of Renishaw probes and probe heads	Full choice of Renishaw probes and probe heads	Full choice of Renishaw probes and probe heads
Max. Velocity Vector	n/a	500mm/sec	n/a	500mm/sec	500mm/sec	500mm/sec
Max. Acceleration Vector	n/a	1000mm/s^2	n/a	1000mm/s^2	1000mm/s^2	1000mm/s^2
Bearings	Air bearings on all axes	Air bearings on all axes	Air bearings on all axes	Air bearings on all axes	Air bearings on all axes	Air bearings on all axes
Z Axis	Pneumatically counterbalanced	Pneumatically counterbalanced	Pneumatically counterbalanced	Pneumatically counterbalanced	Pneumatically counterbalanced	Pneumatically counterbalanced
Max. Balance Weight	1 kg	1 kg	1 kg	1 kg	1 kg	1 kg
Air Consumption	23 l/min (0.8 cfm) @ 4 bar	23 l/min (0.8 cfm) @ 4 bar	23 l/min (0.8 cfm) @ 4 bar	23 l/min (0.8 cfm) @ 4 bar	23 l/min (0.8 cfm) @ 4 bar	23 l/min (0.8 cfm) @ 4 bar
Required Air Pressure	4 bar (60 psi)	4 bar (60 psi)	4 bar (60 psi)	4 bar (60 psi)	4 bar (60 psi)	4 bar (60 psi)
Software	Full graphical interface running on Windows	Full graphical interface running on Windows	Full graphical interface running on Windows	Full graphical interface running on Windows	Full graphical interface running on Windows	Full graphical interface running on Windows

Axiom too 600 - 900mm
Axiom too 900 - 1200mm
Axiom too 1200 - 1500mm
Axiom too 1500 - 1800mm

2320mm

1130mm

Measuring Volume
Axiom too 600 - 640mm x 600mm x 500mm
Axiom too 900 - 640mm x 900mm x 500mm
Axiom too 1200 - 640mm x 1200mm x 500mm
Axiom too 1500 - 640mm x 1500mm x 500mm

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