

Baty Vision Systems - VuMaster 2D Manual / 2D CNC

VuMaster is a 2D vision system with a massive difference.

Due to its innovative absolute 2D scale system, the newly designed VuMaster does not have a conventional moving stage or encoders - just a floating measuring camera that moves anywhere in the measuring range. The result is fast, accurate, 'non contact' measurement over a much larger measuring range - 400mm x 300mm to be exact!

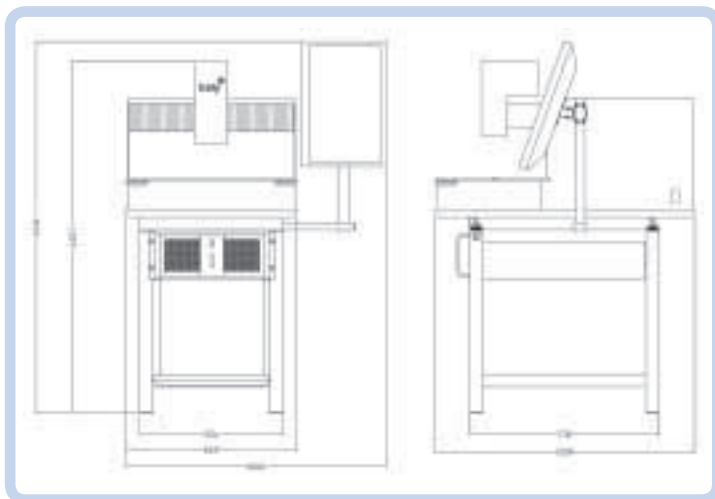
Because the camera moves and the part stays still, there is often no need for expensive and time consuming work holding devices.

VuMaster is either operated manually or inspection routines can be recorded and stored. When played back, these 'programs' guide the operator through a pre-defined inspection procedure recreating the same lighting conditions and using 'Video Edge Detection' to automatically 'capture' feature data.

Finally, a report is generated in the form of a fully dimensioned drawing of the measured part.

Features

- Large 400mm x 300mm measuring range
- Sturdy construction with a granite base
- Supplied with Fusion 2D vision software
- Colourmap measuring technology
- Programmable collimated profile lighting
- Teach and repeat part programming
- Advanced video edge detection
- Digital zoom
- Supplied with stand, rack mount PC and 22" monitor
- Programmable segmented LED surface ring light
- Motorised autofocus
- Image grab
- Auto inspection playback
- CNC and Manual models available



VM2-4030-2D-M

VUMASTER

Code No	Description
VM2-4030-2D-M	VuMaster Manual including 22" LCD monitor
VM2-4030-2D-C	VuMaster CNC including 22" LCD monitor
CAL-MAG-2	Glass calibration artefact

For more information contact optical@bowersgroup.co.uk



Baty Vision Systems - Venture Touch

The highly successful Venture range includes both manual and full CNC systems that cover two standard measuring ranges:

Venture Touch 3D

This advanced Vision system combines a manually operated X-Y measuring stage with a motorised Z axis. The advantage of this is that the servo motor driven Z axis can provide the all-important autofocus function for Z axis measurement without operator influence.

Suitable for the shop floor, the rugged design features a steel / granite stand with fully integrated PC controller running Baty's all new 3 axis touch screen software - Fusion Touch. The full HD touch screen is mounted on an adjustable arm and the software is arranged in a portrait layout for ease of use.

Fusion Touch software features full geometric functionality so circles, lines arcs and points can be measured using dedicated tools. Data points are automatically taken along the edge of the feature using video edge detection, then all measurements are automatically saved, should the inspection need to be replayed for a batch of parts.

All measured features appear in the part view where they can be selected for dimensioning resulting in a dimensioned part view that can be printed or exported to CAD. Tolerances are set for each dimension so that the final inspection reports can classify each dimension as a pass or fail.

Inspection playback

During this process the operator is guided through the inspection routine via the graphical part view. Once the stage has been positioned so that the feature appears in the camera's view, the Video edge detection tools take over and measure the feature automatically. If features are on different planes, the Z axis drives under CNC control to the correct position as defined by the original inspection. All lighting and magnification conditions are also recorded and re-created as each feature is visited. The end result is a highly repeatable process with no operator influence.

Lighting

The programmable LED lighting is also controlled using the touch screen. Segmented surface illumination, through the lens and profile lighting conditions can be adjusted to ensure that the feature edge is perfectly illuminated.



Features

- High resolution 0.5µm scales for increased accuracy
- 6.5:1 zoom optics (with optional CNC control)
- Optional 12x zoom optics
- Programmable segmented LED lighting system
- Z axis dovetail slide mount for increased Z axis capacity
- High precision cross-roller stage
- Ultra-smooth plain rod drives
- Auto video edge detection tools
- Auto programming
- Motorised autofocus

VENTURE TOUCH

Code No	Description
Venture-Touch-2510	Venture Manual with motorised Z and autofocus, Fusion Touch software, 250 x 125 x 155 X, Y, Z measuring range
Venture-Touch-3030	Venture Manual with motorised Z and autofocus, Fusion Touch software, 300 x 300 x 155 X, Y, Z measuring range
CAL-MAG-2	Glass calibration artefact
VI-Vision-Stand	All steel machine stand with granite top

For more information contact optical@bowersgroup.co.uk

Baty Vision Systems - Venture 3D CNC

Venture CNC models take the power of fusion software one stage further by completely automating the inspection process. Now advanced features like scanning and best fitting can be done quickly without taking up the time of skilled operators.

CNC programming is a simple teach and repeat process. Just measure the part once and a full CNC program is created automatically. The zoom lens can also be controlled so that magnification changes are all recorded into the program.

Large Measurement Volume

The use of a touch probe is optimised on a CNC system. Measurements from data points taken using the touch probe can be combined with those taken using video edge detection for optimum speed and reduced inspection times.

A probe changer rack can be installed so that probe modules fitted with a variety of pre-calibrated styli can also be used in the same inspection. When a change of stylus is required, the system automatically puts the current probe module back in the rack and picks up the next to continue the inspection process.

When programming using the touch probe, use only the minimum points required to define each element. Then simply edit in the optimum number of points for each element. The new probe path is then automatically created when the program is played, cutting down both programming and inspection time.



Standard CNC system features include:

- Teach and Repeat programming
- Programmable segmented LED lighting
- 6.5:1 zoom optics (with optional CNC control)
- Optional 12x zoom optics
- High resolution 0.5µm scales for increased accuracy
- CAD import / export
- Scanning & best fitting
- Fully dimensioned part view
- SPC included
- One click output to Excel™
- Autofocus
- 165mm Z axis measuring range on adjustable dovetail slide
- 250mm x 125mm and 300mm x 300mm XY stages available
- Auto program from CAD



Baty's programmable segmented LED lighting

VENTURE AB3-V-CNC

Code No	Description
AB3-V-CNC	Venture CNC with Fusion 3D software, 250mm x 125mm stage, incl. PC and 2 x 19" Monitors
3030-X-Y	Stage upgrade to 300mm x 300mm
CAL-MAG-2	Glass calibration artefact
TP-20 Kit	Touch probe kit incl ref ball, module and stylus

For more information contact optical@bowersgroup.co.uk



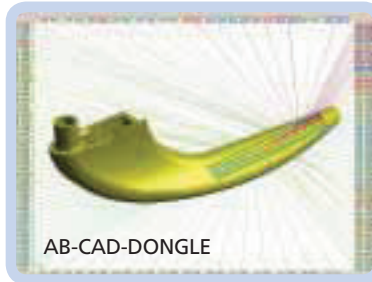
Venture Options

CAD

3D CAD models (STEP or IGES) can be imported and are shown in a floating window. After alignment to the CAD model, points are taken anywhere on the part surface and displayed on the CAD model. The points appear colour coded so as to indicate their distance from the nominal surface.

CAD Comparison

3D CAD models (STEP or IGES format) can be imported and displayed in a floating window. Following a simple part coordinate alignment to the CAD model, data points can be taken anywhere on the part surface using either touch probe or Vision. These data points are then displayed on the CAD model and classified according to their distance from the nominal surface for 3D profile analysis.



SA-196

Cast vee blocks and extended centres for the 2510 and 3030 Venture models.

UFB3030

Universal fixture base provides fixture mounting slots compatible with all projector accessories.

Venture Stand

Rigid steel stand with granite top and integral PC / controller shelf for Venture 2510 and 3030 models.



Glass Reference Standard

Calibration standard with nominal diameters for field of view measurement verification and pixel calibration.



VENTURE OPTIONS

Code No	Description
AB-CAD-DONGLE	CAD comparison software
SB-A-1371-0163	Probe module change rack - 6 port
SA-196-EXT	Dual vee block and centres
VI-3030-UFB	Universal fixture base
VI-Vision-Stand	All steel machine stand with granite top
CAL-MAG-2	Glass calibration artefact

For more information contact optical@bowersgroup.co.uk

Baty Vision Systems - Venture Plus

The Venture Plus range includes all of the standard Venture features with a little more... measuring range, that is.

Large Measurement Volume

The Venture Plus is available in four models:

VP-6460 with 640mm x 600mm x 250mm measuring range

VP-6490 with 640mm x 900mm x 250mm measuring range

The bridge type construction is all aluminium resulting in low inertia and low thermal mass. Air bearings are used on all axes and a granite Y beam is used for increased accuracy. This ensures that the machine will expand and contract uniformly with temperature changes ensuring minimal distortion and subsequent errors. Ambient temperature can be compensated for within the Fusion software making Venture Plus ideal for use on the shop floor.

Complete with our standard zoom optics and programmable, segmented LED surface lighting, Venture Plus offers the same level of camera based functionality as every other Venture.

Standard CNC System Features Include:

- Teach and repeat programming
- Programmable segmented LED lighting
- High resolution 0.5µm scales for increased accuracy
- CAD import / export
- Scanning & best fitting
- Fully dimensioned part view
- SPC included
- One click output to Excel™
- Autofocus
- Renishaw TP20 touch probe joint
- Integrated machine stand

Venture Plus additional features include:

- Rigid, low mass bridge construction
- Integral 6.5:1 zoom optics
- Includes PC controller
- CNC controlled collimated profile lighting
- 250/400mm Z axis measuring range
- Optional automatic temperature compensation
- Optional multi function joystick with colour touch screen display

Options include:

- Multi-function joystick with colour touch screen
- 12:1 zoom optics
- Renishaw SP25 scanning probe

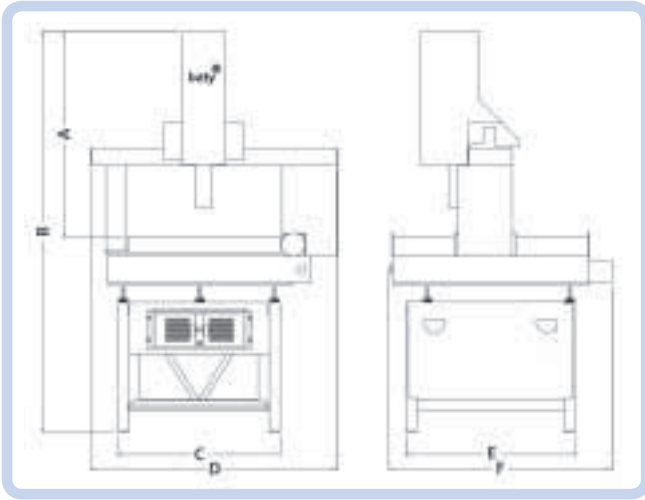
The use of a touch probe is optimised on a CNC system. Measurements from data points taken using the touch probe can be combined with those taken using Video Edge Detection for optimum speed and reduced inspection times.

A probe changer rack can be installed so that probe modules fitted with a variety of pre-calibrated styli can also be used in the same inspection. When a change of stylus is required, the system automatically puts the current probe module back in the rack and picks up the next to continue the inspection process. Only now can this functionality be combined with traditional touch probe technology to offer the ultimate in large format multi-sensing Vision systems - Venture Plus.





Baty Vision Systems - Venture Plus



VP-101040 with 1000mm x 1000mm x 400mm measuring range

VP-101540 with 1000mm x 1500mm x 400mm measuring range



VP-101040 with 1000 x 1000 x 400mm measuring range

VENTURE PLUS

Code No	Description	Dimn – A	Dimn – B	Dimn – C	Dimn – D	Dimn – E	Dimn – F
VP-6460	Venture Plus (640 x 600 x 250mm)	950mm	1851mm	750mm	1140mm	783mm	1030mm
VP-6490	Venture Plus (640 x 900 x 250mm)	950mm	1851mm	750mm	1140mm	1083mm	1330mm
VP-101040	Venture Plus (1000 x 1000 x 400mm)	1440mm	2250mm	1380mm	1470mm	1350mm	1470mm
VP-101540	Venture Plus (1000 x 1500 x 400mm)	1440mm	2250mm	1380mm	1470mm	1850mm	1970mm

For more information contact optical@bowersgroup.co.uk

Fusion Software

Fusion metrology software has been the foundation for Baty's camera based inspection systems for the last decade. The combination of ease of use, advanced edge detection and graphical reporting has established this remarkable software as the standard by which other vision packages are measured.



Dimensioned Part View

Measured results are displayed in the form of a fully dimensioned drawing. Dimensions within the specified tolerance are shown in green whilst dimensions out of tolerance are shown in red for immediate visual status of the measured part.

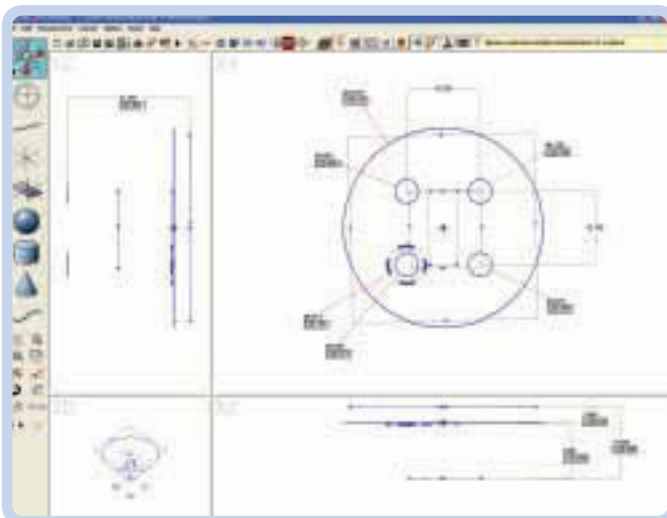
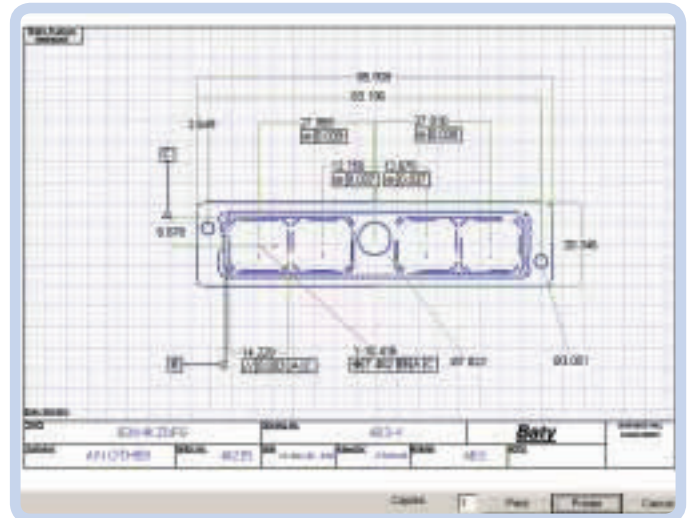
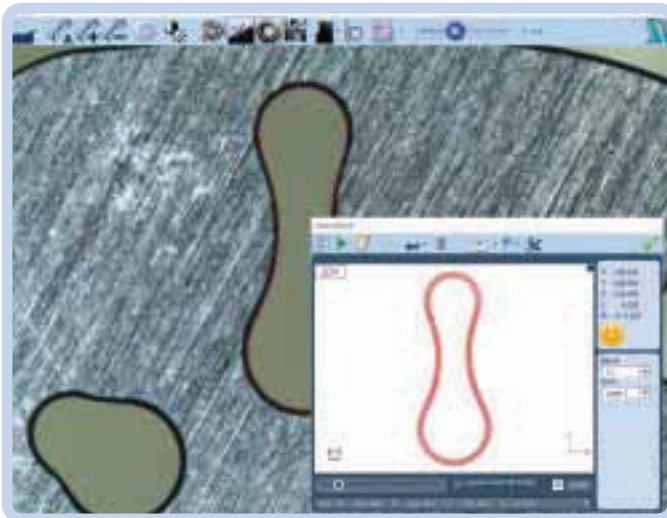
Geometric tolerances can also be displayed using the standard drawing practice. The final dimensioned part view can then be printed as an engineering drawing with a traditional drawing frame containing company details, customer and part details, date and inspection name.

SPC Included

Baty Fusion software will also display SPC batch information for multiple components. Information given includes maximum value in batch, minimum value, user definable sigma value, CPK value, mean shift and also plots two different charts of the batch data.

Easy Reporting

In addition to the graphical representation above, detailed reports can be instantly created showing the feature name, nominal dimension, actual, error, upper and lower limits and a green pass or red fail label for each measured dimension in tabulated format. Geometric tolerance details can also be displayed along with a thumbnail view of the part and batch/customer information. The entire report can be duplicated as an Excel workbook for email.



Baty International						
Drawing No.	17714-4	Order No.		Date	18/06/18 10:30	
Title	Element Shaft	Serial No.		Inspector	DW	
Customer	6000	Material		Notes		
Feature	Dimension	Min	Max	Actual	Upper	Lower
1.1 Dia	20.000	20.000	20.000	20.000	20.000	20.000
2.2 Dia (New Top Surface)	10.000	10.000	10.000	10.000	10.000	10.000
3.4 Dia	10.000	10.000	10.000	10.000	10.000	10.000
4.6 Dia	20.000	20.000	20.000	20.000	20.000	20.000
5.8 Dia	20.000	20.000	20.000	20.000	20.000	20.000
6.10 Dia	20.000	20.000	20.000	20.000	20.000	20.000
7.12 Dia	20.000	20.000	20.000	20.000	20.000	20.000
8.14 Dia	20.000	20.000	20.000	20.000	20.000	20.000
9.16 Dia	20.000	20.000	20.000	20.000	20.000	20.000
10.18 Dia	20.000	20.000	20.000	20.000	20.000	20.000
11.20 Dia	20.000	20.000	20.000	20.000	20.000	20.000
12.22 Dia	20.000	20.000	20.000	20.000	20.000	20.000
13.24 Dia	20.000	20.000	20.000	20.000	20.000	20.000
14.26 Dia	20.000	20.000	20.000	20.000	20.000	20.000
15.28 Dia	20.000	20.000	20.000	20.000	20.000	20.000
16.30 Dia	20.000	20.000	20.000	20.000	20.000	20.000
17.32 Dia	20.000	20.000	20.000	20.000	20.000	20.000
18.34 Dia	20.000	20.000	20.000	20.000	20.000	20.000
19.36 Dia	20.000	20.000	20.000	20.000	20.000	20.000
20.38 Dia	20.000	20.000	20.000	20.000	20.000	20.000
21.40 Dia	20.000	20.000	20.000	20.000	20.000	20.000



Fusion Software

Video Edge Detection

Video edge detection (VED) ensures a repeatable result without relying on the skill of the operator. Hundreds of data points can be taken in an instant to calculate standard geometric features. Standard VED tools include arc, circle, line, point, focus and curve.

Profile Scanning

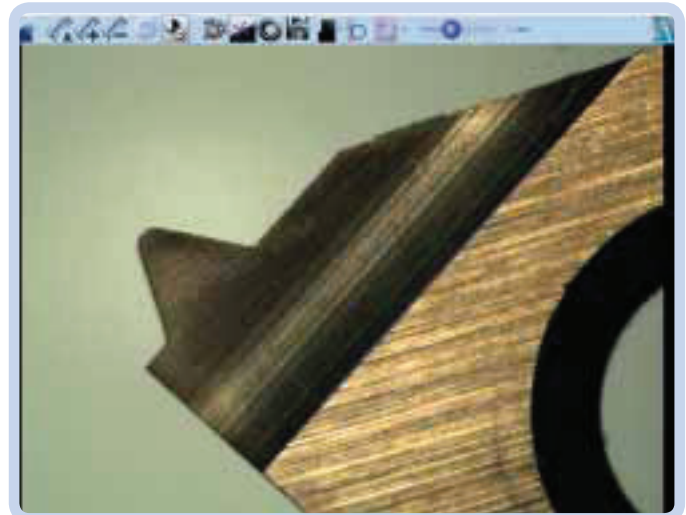
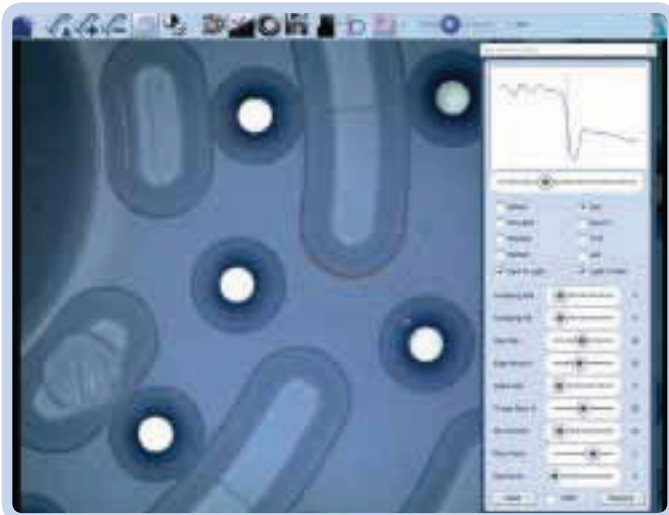
The curve tool automatically traces the profile of an undefined part. The resulting data-point cloud can then be compared to a pre-toleranced DXF master for best fit analysis.

Touch Probe Compatible

Fusion metrology software is ready to accept touch probe measurements as well as optical and camera based. Offsets for each measuring system can be calculated enabling you to use a combination of non-contact measurements in the same inspection. An optional probe storage rack can also be used to allow automatic probe changes mid program.

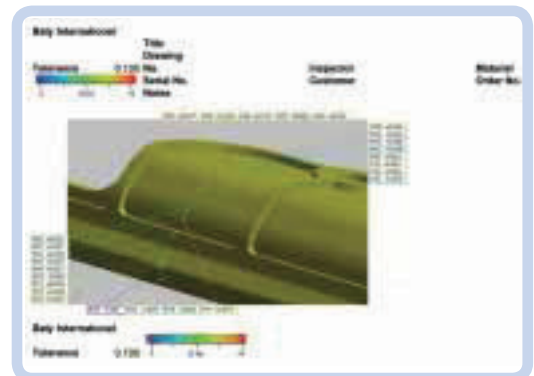
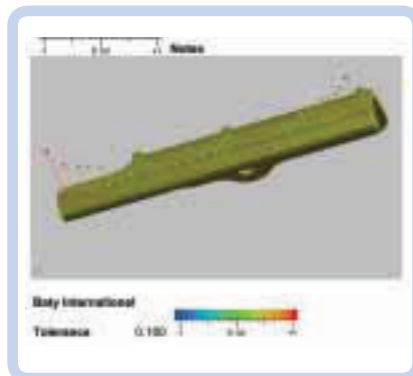
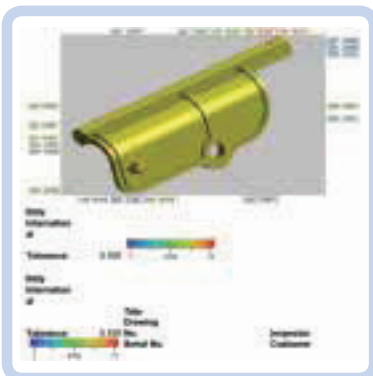
CNC Operation

The CNC option enables fully automatic part inspection with teach and repeat programming and manual joystick control. Parts can be palletised for batch inspection and reports are generated automatically.



CAD Option

Allows measurement data points taken anywhere on the part surface to be compared to a 3D IGES or TIFF CAD model.



Flexmaster Fixtures

Flexmaster components introduce new technology. Our selfwedging clamps offer near zero clamping force. Sliding t-nut tooling blocks provide an infinite variety of fixture solutions.

Even the corner joiners for our frame are dual purpose, providing ridges that allow backlighting to illuminate edges for inspection.

Fixture frame assembly, includes the following:

- 4 off linear slide-frames with t-slots, and laser marked reference scales
- 4 off ridged two-way T-nuts for corner joining and part location
- 4 off sliding hold-down brackets with slots for 2 axis adjustment to mount t-slot frames to venture stage frame

Fasteners

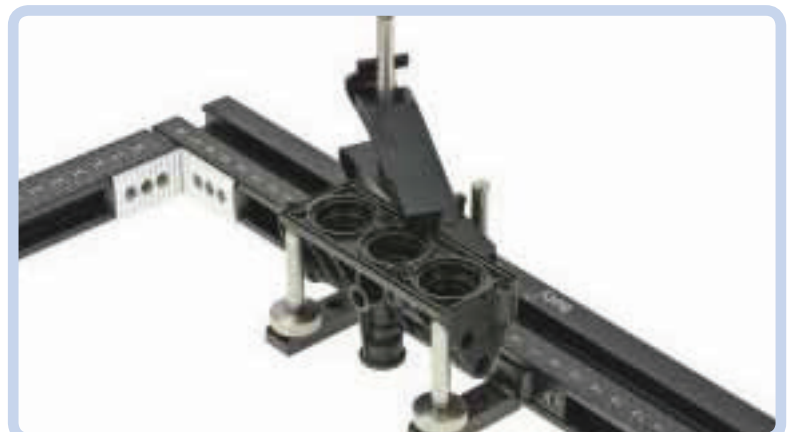
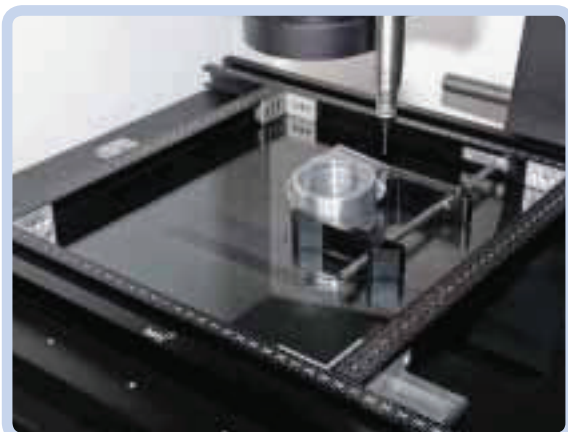
- 30 off stainless grub screws
- 3 off long T-nuts
- 6 off short T-nuts
- 2 off T-nuts with machined vee in end
- 12 off locknut with threaded ID.
(For use with clamp rods, thumbscrew, and spherical locator pin)

Clamps and Rods

- 2 off narrow 'soft-touch' self-wedging tail-spring clamp
- 2 off wide 'soft-touch' self-wedging tail-spring clamp
- 2 off self-wedging V-clamp
- 2 off ridged corner locator clamp
- 3 off stainless clamp rod.
(Use with locknut to attach rods to slideframe, for self-wedging clamps)
- 3 off stainless clamp rod
- 2 off stainless clamp rod

Locators

- 3 off sliding tool blocks with threaded holes for vertical clamp and adjustment
- 4 off adjustable rest button, stainless, spherical top
- 2 off additional ridged two-way t-nuts for part location
- 1 off case





Baty Vision Systems - Technical Specification

TECHNICAL SPECIFICATION

MANUAL SYSTEMS

	VM-4030 VuMaster	VI-2510 Venture	VI-3030 Venture
X Y Z measuring range (mm)	400 x 300	250 x 125 x 165	300 x 300 x 165
Workstage area (mm)	420 x 320	414 x 262	464 x 462
Max workpiece load (kg)	25	25	25
Drive type	Manual	Manual	Manual
Bearings	Air bearings	Cross roller rail guide	Cross roller rail guide
Camera type	2048 x 1590 pixel colour USB2 camera with 8 x 9mm chip and dynamic latch		
Optics / lighting	Fixed objective telecentric lens with programmable LED lighting	6.5:1 detent zoom lens. Fully programmable software controlled white LED segmented surface lighting head with understage and through the lens (TTL) lighting as standard	
Resolution	0.001mm	0.0005mm	0.0005mm
Accuracy	7.5µm	2+L / 100	2+L / 100
Max field of view (FOV)	12mm	16mm*	16mm*
Magnification	20x 350x	Optical zoom ratio 27x - 175x on 17" monitor with digital zoom enhancement to over 1200x	
Touch probe option available	No	Yes	Yes
Probe type	N/A	Renishaw TP20	Renishaw TP20
Change rack compatible?	N/A	N/A	N/A

*using optional 0.5x adapter lens

CNC SYSTEMS

	VM-4030 VuMaster	VI-2510 Venture	VI-3030 Venture	VP-6460 Venture Plus	VP-6490 Venture Plus	VP-100150 Venture Plus
X Y Z measuring range (mm)	400 x 300	250 x 125 x 155	300 x 300 x 155	640 x 600 x 250	640 x 900 x 250	1000 x 1500 x 400
Workstage area (mm)	420 x 320	414 x 262	464 x 462	700 x 940	700 x 1240	1050 x 1850
Max workpiece load (kg)	25	25	25	75	75	75
Drive type	CNC / handwheel	CNC / joystick	CNC / joystick	CNC / joystick	CNC / joystick	CNC / joystick
Bearings	Air bearings	Cross roller rail guide	Cross roller rail guide	Air bearings	Air bearings	Air bearings
Max drive speed	100mm / sec	200mm / sec	200mm / sec	350mm / sec	350mm / sec	350mm / sec
Camera type	2048 x 1590 pixel colour USB2 camera with 8 x 9mm chip and dynamic latch					
Optics / lighting	Fixed objective telecentric lens with programmable LED lighting	6.5:1 CNC zoom lens. Fully programmable software controlled white LED segmented surface lighting head with understage and through the lens (TTL) lighting as standard				
Optional		12:1 CNC zoom lens option for increased FOV	12:1 CNC zoom lens option for increased FOV	12:1 CNC zoom lens option for increased FOV	12:1 CNC zoom lens option for increased FOV	12:1 CNC zoom lens option for increased FOV
Resolution	0.001mm	0.0005mm	0.0005mm	0.0005mm	0.0005mm	0.0005mm
Accuracy	7.5µm	2+L / 100	2+L / 100	2.4 + 0.4 / 100 Volumetric	2.4 + 0.4 / 100 Volumetric	3.8 + 0.4 / 100 Volumetric
Max field of view (FOV)	12mm	16mm*	16mm*	16mm*	16mm*	16mm*
Magnification		20x 350x				
Touch probe option available	No	Yes	Yes	Yes	Yes	Yes
Probe type	N/A	Renishaw TP20	Renishaw TP20	Renishaw TP20	Renishaw TP20	Renishaw TP20
Optional	N/A	Renishaw SP25 scanning probe	Renishaw SP25 scanning probe	Renishaw SP25 scanning probe	Renishaw SP25 scanning probe	Renishaw SP25 scanning probe
Change rack compatible?	N/A	Yes	Yes	Yes	Yes	Yes

*using optional 0.5x adapter lens