

PROFILE PROJECTORS & VISION SYSTEMS



Profile Projectors

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R14 HORIZONTAL PROFILE PROJECTOR



FEATURES

- 340mm (14") screen with 90° crosslines and chart clips
- Profile illumination with halogen lamp and green filter
- Lens magnification choice: 10x, 20x, 25x, 50x and 100x
- Fibre optic surface illumination
- Helix adjustment of light source $\pm 7^\circ$ for accurate thread form projection
- Workstage with machined slot for holding accessories
- Workstage measuring range of 175mm (7") x 100mm (4")
- Digital angle measurement to 1 minute
- 0.5 micron resolution

R400 HORIZONTAL PROFILE PROJECTOR



FEATURES

- 400mm (16") screen with 90° crosslines and chart clips
- Profile illumination with halogen lamp and green filter
- Lens magnification choice: 10x, 20x, 25x, 50x and 100x
- Fibre optic surface illumination
- Helix adjustment of light source for accurate thread form projection
- Workstage with two machined slots for holding accessories
- Workstage measuring range of 300mm (12") x 150mm (6")
- Digital angle measurement to 1 minute



R600 HORIZONTAL PROFILE PROJECTOR



FEATURES

- 600mm (24") screen with 90° cross lines and chart clips
- Heavy duty workstage with 450mm (18") x 200mm (8") measuring range and 2 machine slots for workpiece holders
- Angular rotation of $\pm 15^\circ$ on workstage for measuring threadforms or cutting tools
- Vertical 200mm (8") Y axis power driven with joystick control
- Lens magnification choice - 5x (single lens mount), 10x, 20x, 25x, 50x, 100x
- 4 position rotating lens turret for ease of lens changing (excluding 5x)
- Profile illumination with halogen lamp and green filter
- Screen hood and curtains for use in bright ambient light conditions
- Fibre optic surface illumination
- Digital angle measurement
- 0.5 micron resolution

SM300 VERTICAL PROFILE PROJECTOR



FEATURES

- 300mm diameter screen
- Top quality profile projector highly versatile and easy to operate
- Large travel range 150mm (6") x 50mm (2") as standard
- Linear scale stage with 0.0005mm resolution
- Fine ground glass screen for clear image with cross hairs
- Screen complete with cross hair lines and chart clips
- Built-in profile and surface illumination
- 10x, 20x, 50x, 100x projection lenses available
- Display-readout unit GMR included in standard delivery



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SM350 VERTICAL PROFILE PROJECTOR



FEATURES

- Fully usable 350mm screen
- Digital screen protractor
- Built in helix adjustment
- Sturdy all-steel design
- Heavy duty cross roller bearings
- Quick release 'X' and 'Y' travel
- Easy-view vertical screen
- Large stage travel 250mm (10") x 125mm (5")
- Rotating chart clips
- Fibre optic illumination for surface measurement
- 0.5 micron resolution

SM20 VERTICAL PROFILE PROJECTOR



FEATURES

- 500mm screen with 90 degree crosslines and chart clips
- Angled screen for easy viewing
- Profile illumination with halogen lamp and green filter
- Surface illumination through twin fibre optics for bright full colour surface inspection
- Single lens mounting
- Lens magnification choice: 5x, 10x, 20x, 25x, 50x and 100x
- Helix adjustment of light source for accurate thread form projection
- Large stage travel 250mm (10") x 125mm (5")
- Digital angle measurement
- 0.5 micron resolution

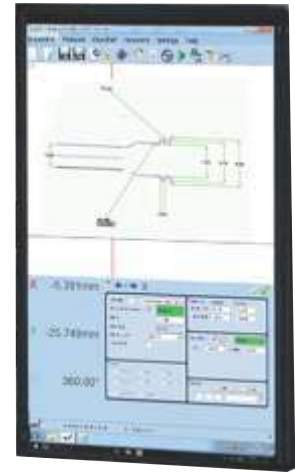
Profile Projectors



FUSION TOUCH READOUT

FT2: Complete TOUCH SCREEN DRO with 2D Fusion touch software. Full geometric functionality, view of measured part can be printed as a fully dimensioned drawing. Full reporting capability includes, SPC, tabulated details with pass / fail analysis, auto link to Excel and auto sequence programming feature. Windows O/S and built in 22"portrait touch screen monitor.

FT2-E: Complete TOUCH SCREEN DRO with 2D Fusion Touch software as above. Built-in optical edge detection allows data points to be taken 'on the fly' as the projected image is passed under the screen-mounted fibre optic sensor.



Model Name	R14	R400	R600
X,Y measuring Range	175mm(7") x 100mm(4")	300mm(12") x 150mm(6")	450mm(18")(optional 300mm(12")) x 200mm(8")
Work stage Area	325mm(12.8") x 100mm(4")	480mm(19") x 127mm(5")	600mm(24") x 200mm(8")
Screen Size	340mm(14") (Rotating)	400mm(16") (Rotating)	600mm(24") (Rotating)
Max Work Piece Load	10 kg	15 kg	50 kg
Drive Type	Manual	Manual/CNC	Manual/CNC
Image	Inverted and Reversed	Erect, reversed left to right	Erect, reversed left to right
Optics/Lens Magnification	x10, x20, x25, x50, x100 (condenser required for x50 and x100)	x10, x20, x25, x50, x100 (condenser required for x50 and x100)	5x (special order, single lens mount), x10, x20, x25, x50, x100 (condenser required for x50 and x100)
Resolution	0.0005mm	0.0005mm	0.0005mm
Accuracy	3 + L/80 µm	2.5 + L/80 µm	2.5 + L/80 µm
Light Source	Profile 12v 100w lamp (Tungsten Halogen) Surface 12v 100w lamp (twin adjustable fiber optics)	Profile 12v 100w lamp (Tungsten Halogen) Surface 12v 100w lamp (twin adjustable fiber optics)	Profile 24v 150w lamp (Tungsten Halogen) Surface 24v 250w lamp (twin adjustable fiber optics) Profile 0.05% Surface 0.1%
Magnification accuracy	Profile 0.05% Surface 0.1%	Profile 0.05% Surface 0.1%	Angular rotation of ± 15° on work stage for measuring thread forms or cutting tools
Helix Adjustment	± 7° by light source alignment	Profile 0.05% Surface 0.1% ± 7° by light source alignment	
Height	966mm	1019mm	1920mm
Width assembled	400mm	849mm	1550mm (without hood 728mm)
Depth (length)	1210mm	1028mm	1872mm (without hood 1500mm)
Weight - average	60kg	140kg net	530kg nett
Powers Supply (Volt)	220 / 240 Volt 50Hz or 110 60Hz		

Model Name	SM20	SM300	SM350
X,Y measuring Range	250mm(10") x 125mm(5")	150mm (6") x 50mm (2")	250mm(10") x 125mm(5")
Work stage Area	412mm(16") x 260mm(10.5")	340mm(13.4") x 152mm(6")	412mm(16") x 260mm(10.5")
Screen Size	500mm(20") (Rotating)	300mm(11.8") (Rotating)	350mm(14") (Rotating)
Max Work Piece Load	15 kg	15 kg	15 kg
Drive Type	Manual	Manual	Manual/CNC
Image	Inverted and reversed	Erect and reversed	Erect and reversed
Optics/Lens Magnification	x5, x10, x20, x25, x50, x100 (condenser required for x50 and x100)	x10, x20, x50, x100 (condenser required for x50 and x100)	x10, x20, x25, x50, x100 (condenser required for x50 and x100)
Resolution	0.0005mm	0.001mm	0.0005mm
Accuracy	2.5 + L/80 m	2.5+L/80µm	2.5 + L/80 m
Light Source	Profile 12v 100w lamp (Tungsten Halogen) Surface 12v 100w lamp (twin adjustable fiber optics)	Profile 24v 150w lamp (Tungsten Halogen) Surface 12v 100w lamp (half reflecting mirror)	Profile 12v 100w lamp (Tungsten Halogen) Surface 12v 100w lamp (twin adjustable fiber optics)
Magnification accuracy	Profile 0.05% Surface 0.1%	Profile 0.05% Surface 0.1%	Profile 0.05% Surface 0.1%
Helix Adjustment	± 7° by light source alignment	± 7° by light source alignment	± 7° by light source alignment
Height	1925mm	1115mm	1001mm
Width assembled	790mm	775mm	846mm
Depth (length)	10201	7806mm	946mm
Weight - average	50kg	130kg	133kg
Powers Supply (Volt)	220 / 240 Volt 50Hz or 110 60Hz		

The highly successful Venture range combines both Manual and CNC axis that cover two differing stage sizes.

Venture 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 and auto focus changes are all recorded into the program.

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.

Model Name	Description
VM-4030-CNC	V μ MASTER - CNC CNC – X: 400mm, Y: 300mm with Digital Anemos Scale Technology on a granite base.
VI-2510-MAN	MANUAL – X: 250mm, Y: 125mm, Z: 150mm 0.5 Micron resolution scales. Manually operated 6.5:1 Micro Zoom Lens.
VI-2510-TOUCH	MANUAL – X: 250mm, Y: 125mm, CNC Z: 150mm and Auto Focus 0.5 Micron resolution scales. Manually operated 6.5:1 Micro Zoom Lens.
VI-2510-CNC	CNC – X: 250mm, Y: 112mm, Z: 150mm and Auto Focus. 0.5 Micron resolution scales. Manually operated 6.5:1 Micro Zoom Lens.
VI-3030-TOUCH-XT	MANUAL – X: 300mm, Y: 300mm, CNC Z: 200mm and Auto Focus. 0.5 Micron resolution scales. Manually operated 6.5:1 Micro Zoom Lens.
VI-3030-CNC-XT	CNC – X: 300mm, Y: 300mm, Z: 200mm and Auto Focus. 0.5 Micron resolution scales. Manually operated 6.5:1 Micro Zoom Lens.

FEATURES

- Teach and Repeat programming
- Programmable segmented LED lighting
- 6.5:1 zoom optics (with optional CNC control)
- Optional 12x zoom optics
- High resolution 0.5 μ m scales for increased accuracy
- Optional CAD import / export
- Auto program from CAD
- Adding DXF scanning and best fitting
- Fully dimensioned part view
- Real-time SPC included
- One click output to Excel™
- Autofocus
- Free software upgrades till machine life



Venture Plus Vision Systems



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The Venture Plus range includes all of the standard Venture features with a little more... 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.

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. This functionality can be combined with our sophisticated Edge Detection to offer the ultimate in large format multi-sensing Vision systems - Venture Plus.

Model Name	Measuring Range XYZ
VP-6460-CNC	640mm x 600mm x 250mm
VP-6490-CNC	640mm x 900mm x 250mm
VP-80100-CNC	800mm x 1000mm x 460mm
VP-80160-CNC	800mm x 1600mm x 460mm
VP-100120-CNC	1000mm x 1200mm x 750mm
VP-100200-CNC	1000mm x 2000mm x 750mm

FEATURES

- Rigid, low mass bridge construction
- Integral 6.5:1 CNC zoom optics
- Teach and repeat programming
- Programmable segmented LED lighting
- High resolution 0.5 μ m scales for increased accuracy
- Optional CAD import / export
- Adding DXF scanning and best fitting
- Fully dimensioned part view
- Real-time SPC included
- One click output to Excel™
- Autofocus
- Renishaw TP20 touch probe joint
- CNC controlled collimated profile lighting
- Optional automatic temperature compensation
- Free software upgrades till machine life





Fusion Software

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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.

IMAGE STITCHING AND PROFILE SCANNING

A camera image can be taken and stored every time the XY stage is paused. These images may be "stitched" together to allow the user to zoom out and view the entire component in the camera image view. Imported dxf files may be used as overlays which can be super imposed on top of the stitched image, providing a visual comparison of the entire part to the tolerance bands shown on the dxf. If a profile measurement is required, the curve tool can be used to automatically trace the profile of the part. The resulting data-point cloud can then be viewed both in the part view, for reporting, as well as the stitched camera image. A profile dimension can easily be added to define the best fit profile error. Image stitching can also be used to quickly grab all of the features of a large 2D component. A CNC inspection routine can then be created by simply clicking on the feature to be measured using the "one click" feature or "all features in an area" tools.

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. For touch probe scanning applications, Renishaw's SP25 scanning probe option can be specified.

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.

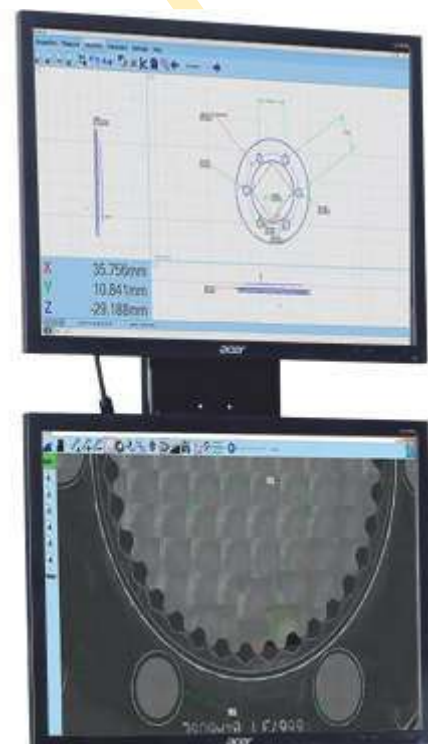
CAD OPTION

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

Zoom Lens Magnification Specification in mm

6.5:1 Zoom Lens (6X Lens)					
Zoom	Effective Mag	Pixel Size	Field of View		
			X Axis	Y Axis	Diagonal
MIM	37	3.9	8.0	6.0	10.0
1	50	2.9	6.0	4.4	7.4
2	72	2.0	4.2	3.1	5.2
3	110	1.3	2.7	2.0	3.4
4	154	1.0	1.9	1.5	2.4
MAX	194	0.8	1.5	1.2	1.9

12:1 Zoom Lens (12X Lens)					
Zoom	Effective Mag	Pixel Size	Field of View		
			X Axis	Y Axis	Diagonal
MIM	25	4.8	9.9	7.4	12.3
1	33	3.7	7.6	5.7	9.4
2	46	2.6	5.4	4.0	6.7
3	65	1.9	3.8	2.9	4.8
4	92	1.3	2.7	2.0	3.4
5	130	0.96	1.9	1.5	2.4
6	180	0.68	1.4	1.0	1.7
MAX	220	0.56	1.1	0.9	1.4



Technical Specifications - Vision System



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		MANUAL SYSTEMS	SEMI AUTOMATIC
	VM-4030 VuMaster	VI-2510 Venture	Venture-Touch-3030
X Y Z measuring range (mm)	400 x 300	250 x 125 x 165	300 x 300 x 300
Workstage area (mm)	420 x 320	414 x 262	464 x 462
Max workpiece load (kg)	25	25	25
Drive type	Manual	Manual	Manual XY CNC Z
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	No
Probe type	N/A	Renishaw TP20	N/A
Change rack compatible?	N/A	N/A	N/A

*using optional 0.5x adapter lens

CNC Systems					
Model	VM-4030 VuMaster	VI-2510 Venture	VI-3030 Venture XT CNC	VP-6460 Venture Plus	VP-6490 Venture Plus
X Y Z measuring range (mm)	400 x 300	250 x 125 x 165	300 x 300 x 200	640 x 600 x 250	640 x 900 x 250
Workstage area (mm)	420 x 320	414 x 262	464 x 462	700 x 940	700 x 1240
Max workpiece load (kg)	25	25	25	75	75
Drive type	CNC / hand wheel	CNC / joystick	CNC / joystick	CNC / joystick	CNC / joystick
Bearings	Air bearings	Cross roller rail guide	Cross roller rail guide	Air bearings	Air bearings
Max drive speed	100mm / sec	200mm / sec	200mm / 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 under stage and through the lens (TTL) lighting as standard			
Optional	12:1 CNC zoom lens option for increased FOV				
Resolution	0.001mm	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
Max field of view (FOV)	12mm	16mm*	16mm*	16mm*	16mm*
Magnification	20x 350x				
Touch probe option available	No	Yes	Yes	Yes	Yes
Probe type	N/A	Renishaw TP20			
Optional	N/A	Renishaw SP25 scanning probe			
Change rack compatible?	N/A	Yes	Yes	Yes	Yes

*using optional 0.5x adapter lens