

Fowler[®]

FUSION

Making Measurement Easy



Catalog 2019.04

www.fowlerprecision.com

Fowler® FUSION



The guiding philosophy behind Fowler Fusion is to make complex measurement easy. Fusion represents a powerful synthesis of innovative 3D precision measuring equipment, powered by user-friendly and feature-rich software.

Fusion 3D software has been written by engineers for engineers and sets the industry standard for robust simple-to-use software. Designed around a graphical interface, Fusion 3D can work in 2D or 3D, on manual or CNC CMMs and is equally at home when used with either touch, scanning or vision systems.

Fusion 3D software is not only ahead of its 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.

Fusion software allows inspection professionals and manufacturing engineers to be experts on one software system that works equally well across Fowler's' extensive 3D product range.

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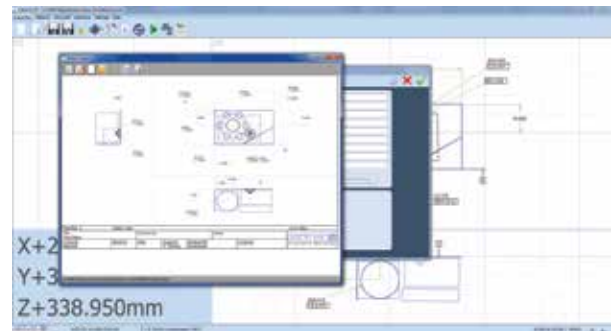
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MAKING MEASUREMENT EASY

The whole philosophy for Fowler FUSION is to make measurement easy. FUSION software has been written by engineers for engineers and sets the industry standard for simple-to-use software. Designed around a graphical interface, FUSION 3D can work in 2D or 3D, on manual or CNC CMMs and is equally at home when used with either touch, scanning or vision systems. It is easy to understand why FUSION has become the software of choice not only for FUSION, but for numerous other manufacturers of measuring devices around the world.

FUSION 3D software is not only way ahead of its 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.



FUSION software is revolutionary. As a component is measured a representation of it is built up on the screen. The user simply clicks on the measured features to call up dimensions exactly as they would appear on a 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.

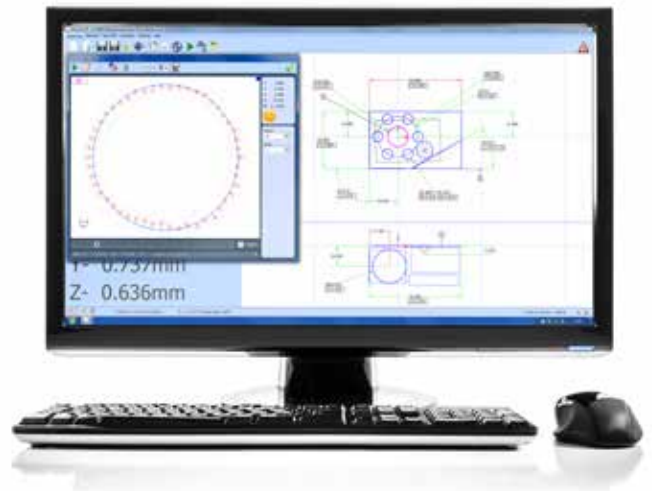
Further reports are available to show the form of features (roundness, straightness etc.), hole or point positions, or complete batch results on one report. The user's company name also appears on all outputs.

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

Popular throughout the world and available in many languages, FUSION measurement software provides the user with a powerful, yet easy-to-use solution for inspection measurements. This not only increases component throughput but vastly reduces the learning period for new users.

Every FUSION license also benefits from, [no annual subscription or maintenance fees](#) and [free software upgrades](#) for life, hence minimal cost of ownership.

Welcome to cost-effective precision.



Key Features:

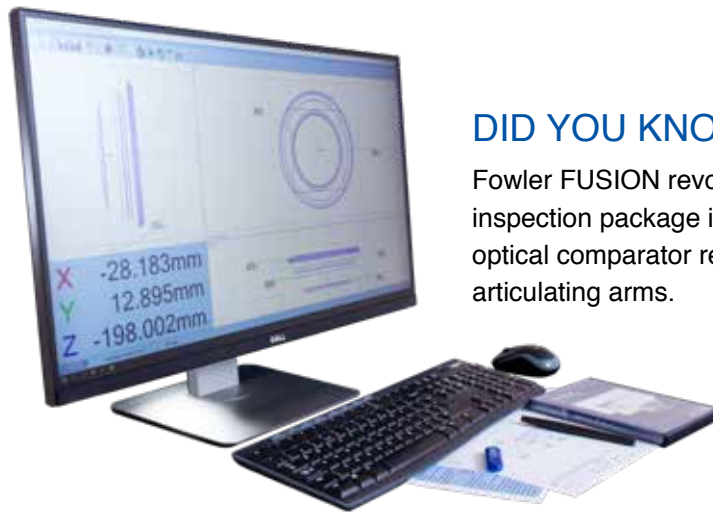
- Automatic measurement routines
- Powerful interactive graphics window
- Automatic feature recognition
- 2D and 3D manual and CNC inspection
- Geometric feature inspection
- Free form curve inspection
- DXF data import/export
- STEP and IGES export for reverse engineering
- Feature construction
- Intelligent feature projection
- GD&T dimensions and tolerances

Programme Tools:

- Teach & repeat programming
- Drag and drop programme editor
- Run programs from any point
- Measure a subset of features
- Simple object-based programming
- No complex programming language
- Automated batch inspection
- Password protect programmes
- Automatic safety moves
- Feature replicator

Report Formats:

- Engineering drawing GD&T report
- Simple PASS/FAIL report
- Form plots
- Batch summary report
- Tabulated reports
- Graphical fly-out labels
- Drag & drop reporting
- Real-time SPC
- Combine multiple views
- Export to Excel
- Historical data reporting



DID YOU KNOW?

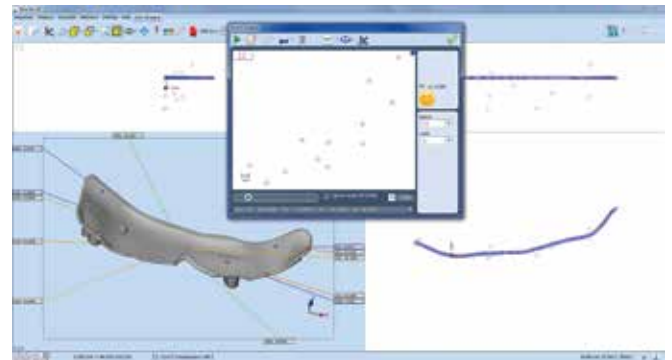
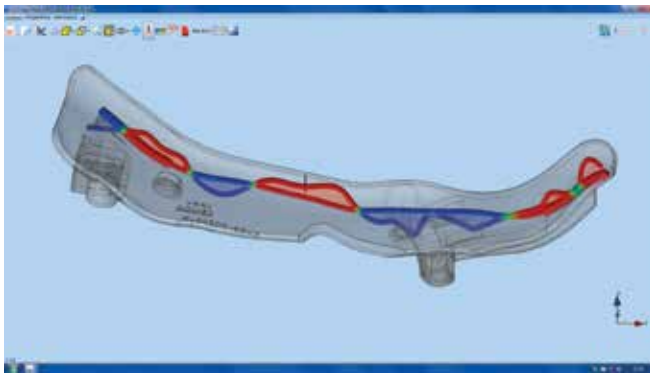
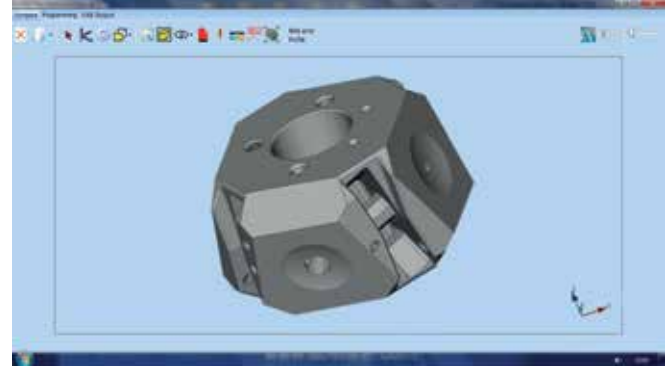
Fowler FUSION revolutionary 3D software inspection package is available for CMM retrofits, optical comparator retrofits, vision systems and articulating arms.

CAD COMPARISON SOFTWARE MODULE

The FUSION CAD Comparison software module enhances FUSION 3D with the capability to compare measured points to a CAD model. Often this will be the only way to measure complex parts, or perhaps sometimes drawings for the component simply don't exist.

Powerful alignment routines allow measurement points to be best-fitted to the model. Colour coded errors can then be displayed on the model to produce both graphical and tabulated reports that are extremely clear and very easy to understand.

FUSION'S CAD comparison module allows the input of either STEP or IGES files as standard and allows reports to be exported as an Excel spreadsheet. It really does make measuring complex parts easy, whether on a manual or CNC CMM.



CAD Formats

- IGES and STEP import and export
- DXF export
- Re-scale Models
- Simple measurement of complex parts

Alignments

- Point cloud best-fit
- Feature best-fit
- Best-fit constraints
- Graphical and tabulated reports
- Export to Excel

Report Formats

- On CAD fly-out labels
- Colour deviation whiskers
- Colour point markers
- Configurable colour options
- Combine multiple views
- Graphical and tabulated reports
- Export to Excel

FUSION Software

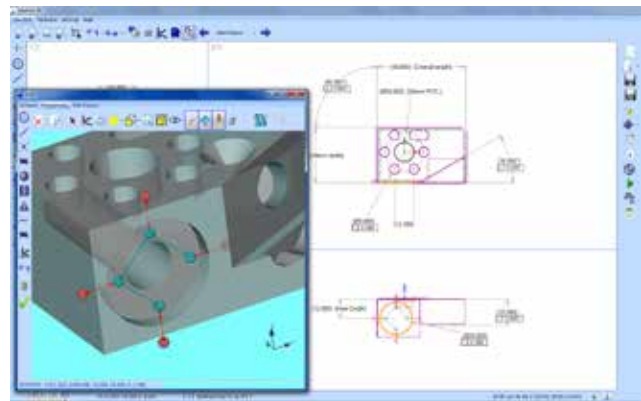
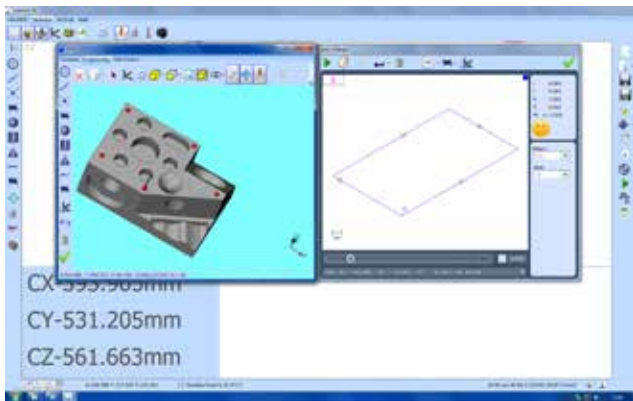
Part Number	Description
54-950-106-0	FUSION 3D CAD Comparison Module
54-950-106-1	FUSION 3D CAD Comparison Module - Off-line

PROGRAMMING FROM CAD SOFTWARE MODULE

For many years FUSION 3D software has been setting the industry standard for both ease of use and speed of programming. However, until now this has been best done by using the teach-and-repeat method of programming when measuring a component. But what if you want to prepare the measurement programme before you even have the first component? Our CAD programming module allows the simplest programming possible from either an IGES or STEP CAD model.

If you can use FUSION 3D software then you will already know how to use the CAD programming module – it couldn't be easier. Rather than taking measurement points on a component, you can now just click on the surface of the model where you would like the points to be taken.

Feature Predict works in the same way as when measuring, for instance, if you click in four places on the same plane on the model, then the software will automatically create a Plane Measure unit with those four points in it. Then click on a different feature and it will automatically close the Plane window and look for another feature. If you click on a circular feature it will take just one click to produce a circle or two clicks for a cylinder. Suddenly programming in FUSION 3D just got even easier!



DID YOU KNOW?

The Programming from CAD module allows programs to be created away from the CMM so the machine is free to measure other parts. You don't even need a part to create a program - just the model.

FUSION Software

Part Number	Description
54-950-107-0	FUSION Programming from CAD Module
54-950-107-1	FUSION 3D Programming from CAD Module - Off-line
54-950-108-0	FUSION 3D Geometric Measurement Software

Portable Precision THE NEXT DIMENSION

A revolutionary solution to a complicated problem

Utilizing advanced technology, software, design and electronics, the zCAT is manufactured as a compact self-contained unit that is fundamentally different than existing CMM technology, design and operation. From initial equipment acquisition through set-up, training and maintenance, the zCAT offers significant cost reductions without compromising measuring accuracy or performance.

Easy-to-use

The zCAT is the easiest DCC CMM to use. Built with the intention of lowering the threshold of training needed to successfully operate and even program a DCC CMM, every component, from the mechanics to the software, has been examined for optimal user experience and ease of use.

Probe System

The zCAT ensures accuracy with an industry-standard probe system. Find comfort in knowing that easy-to-acquire, accurate results are measured by this reliable touch-trigger probe system. Whatever your measurement task, this probe system allows for the optimal stylus arrangement for accuracy.



Software

The zCAT comes with ControlCAT - built-in, easy-to-use, geometric measurement software controlled through an intuitive, icon-based touchscreen interface. Take advantage of the direct computer controlled measurements without the need for a secondary computer. From shop technicians to dedicated CMM operators, anyone can feel comfortable operating the zCAT.

Programming

Automate measuring processes, and gain accurate data time after time. The unique zCAT clutch seamlessly shifts from direct computer to manual control without the need for flipping switches or clicking buttons. Simply, move the probe manually, and the computer will remember and reproduce the movements for accurate, repeatable measurements.

Designed and Manufactured in the U.S.A.



We manufacture the zCAT in the United States. From California to Massachusetts, we're taking advantage of American ingenuity, drive, and passion to create a high quality product that will help advance the capabilities of those who use it.

Portability

The zCAT is the world's first portable direct computer control coordinate measuring machine (DCC CMM). At only 30 pounds, the zCAT conveniently goes with you wherever you need it. No longer are you required to take the part to the CMM; from a surface plate, to a table on the shop floor or on a large part itself, the zCat can be deployed directly in the manufacturing process.

Power

Being tethered to an outlet is a thing of the past. The zCAT is powered by a built-in 10.8 volt lithium ion battery, providing enough power to gain precise, accurate measurements for four hours in the field. The zCAT is truly wireless. A power supply charger is included for quick recharges between or during use.



System Components



zCAT DCC Coordinate Measuring Machine

Components

- zCAT CMM - 4 Axes
- ControlCAT metrology software
 - Easy to use geometric measurement tool
 - Measures manually or DCC. Creates constructions for most common geometrics including:

Plane	Line	Point	Sphere	Angle	PCD
Circle	Slot	Cone	Reference	Cylinder	Cloud
 - Reports actual and nominal information to Excel spreadsheet
 - Program remembers geometry and plays back for repetitive part measurements
- Renishaw TP20 probe
- Battery
- Ethernet communication (Bluetooth optional)
- I++ software interface
- zCAT Wedge excel export software
- Training part and calibration sphere
- Quick start guide
- zCAT dust cover
- Reusable shipping container

zCAT

Part Number	Description
54-950-001-0	zCAT Portable CMM Machine
Accessories	
54-950-200-0	1mm Ball Probe Module
54-950-201-0	Vertical only 2mm Probe
54-950-202-0	Horizontal only 2mm Probe
54-950-120-0	Calibration Service
54-950-110-0	5 Year Service and Calibration Contract
54-950-115-0	Extended 5 Year Warranty

zCAT Specifications

Working volume	X and Y 700mm diameter, Z 250mm
Diametral Accuracy (μm)	$3.0 + (D / 100\text{mm})$
Linear Accuracy (μm)	$5.0 + (L / 100\text{mm})$
Fixturing accuracy requirement	5mm
Machine speed	User controlled to 150 mmps
Machine air requirement	None required
Construction	Stainless steel for all structural components
Machine power requirements	100-240 V AC \pm 10%, 50-60Hz
Battery life	4 hours with normal use, 3 hours at peak
Power consumption	Peak 15 W, normal 10 W
Manual motion control	User controlled by hand movement of probe
Controller	Onboard PCB provides motion control, error mapping, I++ interface and ControlCAT metrology software
Temperature compensation	Onboard monitoring and compensation
Probe Type	Renishaw TP20 probe
Machine weight	13.6kg, 30lbs
Machine dimensions (W x D x H)	420mm x 172mm x 620mm



zCAT - Loc-N-Load™ Fixture Systems



Further enhance the value of zCAT with the LEAN, quick-swap Loc-N-Load™ fixture system. Install zCAT onto the unique Loc-N-Load™ base and start inspecting on the shop floor or nearest conference table. Interlocking fixture plates quickly secure and release with the use of magnets creating highly repeatable setups.

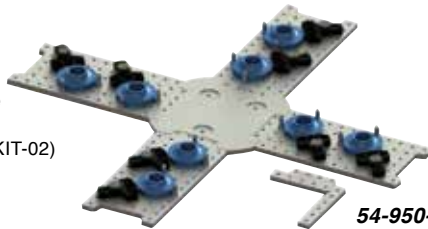
- Create multiple fast-swap setups for your zCAT!
- Ready-made interlocking plates make low-cost fixtures
- Inspect more parts per shift, even with less-skilled inspectors
- Easily access your granite
- Use as dedicated tooling - add to job box

Get started with a pre-configured bundle and add plates as work requires. Creating a LEAN QC department need not be expensive with zCAT and Loc-N-Load™ quick-swap fixturing.

Choose a bundled set of Loc-N-Load™ fixture plates

Bundle includes

- 1 Base
- 4 6 x 12 plates
- 1 Qualifying plate
- 1 Angle plate
- 1 Clamp kit (TR-KIT-02)



54-950-170-0

Bundle includes

- 1 Base
- 4 6 x 6 plates
- 2 6 x 12 plates
- 1 Qualifying plate
- 1 Angle plate
- 1 Clamp kit (TR-KIT-02)

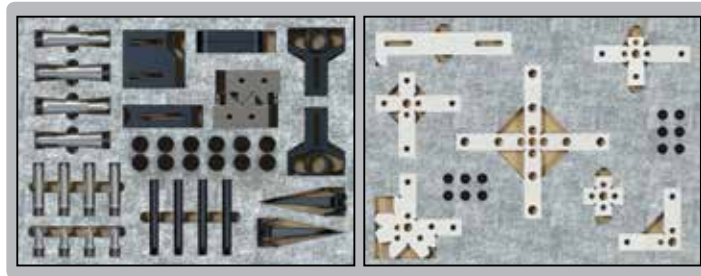


54-950-175-0

System Accessories also included: A unique plate for the qualifying ball/bar that can be removed quickly when not in use and an angle plate as a stop to locate and inspect right on the granite.

Each bundled system comes complete with this versatile 64 piece Work Holding Kit

A **Work Holding Kit** with a variety of non-marring spring-action clamps, stand-offs, and low profile stops and rails is included with each fixture system



54-950-185-0

Work Holding Kit (54-950-185-0)

Includes:

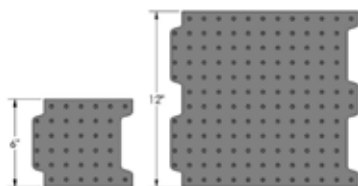
- 4 Cross-Bow™ Clamp
- 4 D-Block™ Stop
- 4 Trigger-Block™ Clamp
- 12 Silver-Bullet™, 4 sets / 3
- 4 Steel shaft / stand-off
- 2 Trigger-Finger™
- 2 Hole Adjuster
- 7 Simple-Stop™ Rails, 1 set / 7
- 25 Hex Keys, plus assorted screws

Additional Individual Loc-N-Load™ fixture plates or zCAT bases

Order additional Loc-N-Load™ fixture plates and work holding as required. Fixture part families affordably for quick-swap of parts and faster inspections whether you're on the shop floor or metrology lab. Made of clear anodized aluminum, 0.5" thick, 1 x 1" spacing, 1/4-20 thread. Inquire about metric.



54-950-186-0



54-950-181-0

54-950-182-0



54-950-188-0



54-950-189-0

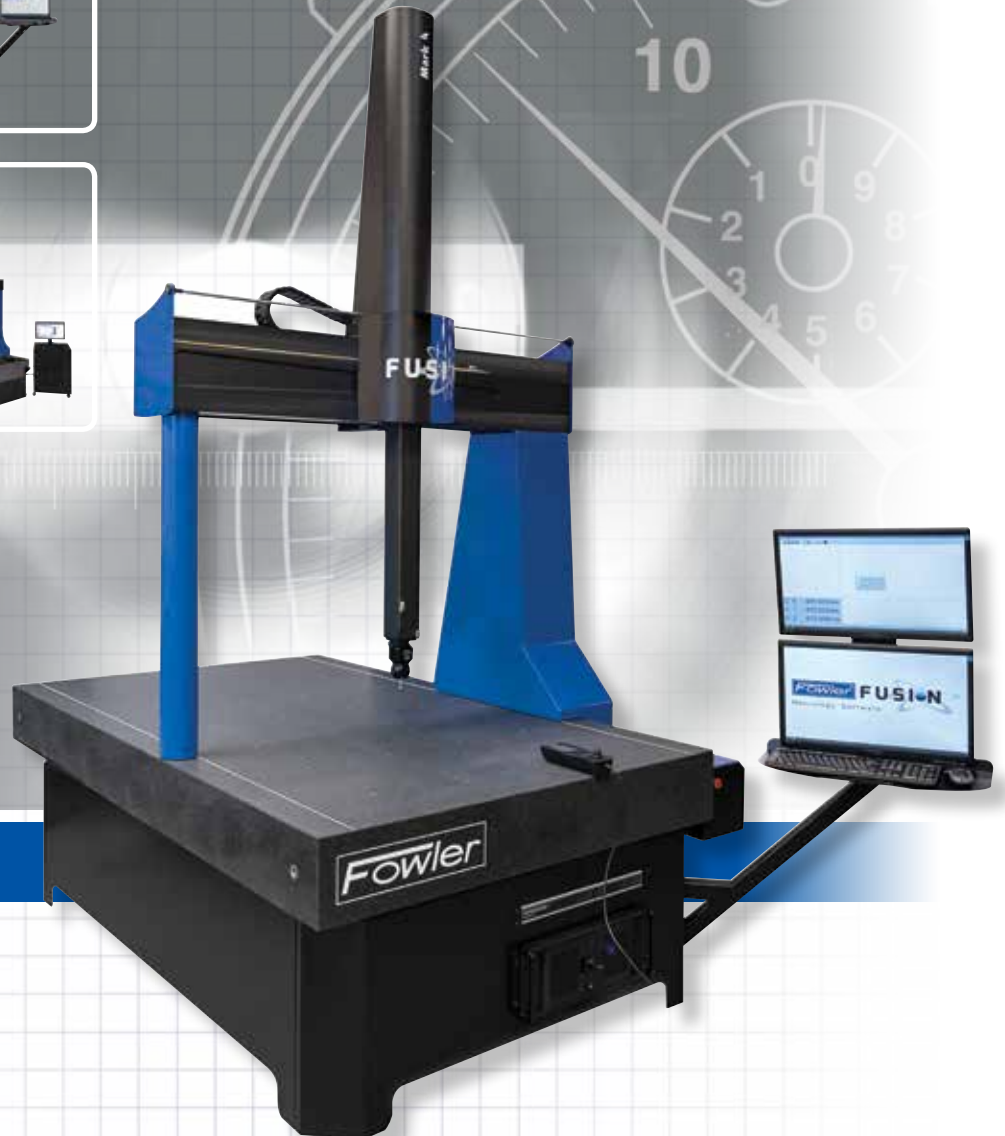
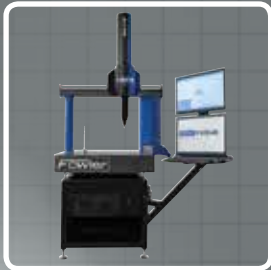
Loc-N-Load™ Fixture Systems

Part Number	Description
54-950-170-0	Loc-N-Load™ Quick-Swap fixture system - No. 1
54-950-175-0	Loc-N-Load™ Quick-Swap fixture system - No. 2
54-950-180-0	Loc-N-Load™ Base plate ONLY
54-950-185-0	Loc-N-Load™ Work holding kit
Additional Loc-N-Load™ Fixture Plates - Rails, End Caps, Plates	
54-950-186-0	6"/152.4mm x 6"/152.4mm fixture plate
54-950-187-0	6"/152.4mm x 12"/304.4mm fixture plate
54-950-188-0	6"/152.4mm x 18"/457.2mm fixture plate
54-950-189-0	12"/304.8mm x 12"/304.8mm fixture plate
Accessories for Loc-N-Load™ Plates	
54-950-181-0	Adapter plate 6"/152.4mm x 1"/25.4mm
54-950-182-0	Angle plate/ Stop 6"/152.4mm x 6"/152.4mm

Fowler[®]

FUSION

COORDINATE MEASURING MACHINES



MARK 2 - Manual / CNC

THE COMPLETE INSPECTION SYSTEM

Fast, accurate and reliable, the MARK 2 CMM comes in four different sizes with Y axis travel up to 1500mm. Available as either a manual machine or with full CNC control, the MARK 2 can be used with touch trigger probe, or continuous contact scanning probe.

The all aluminium bridge structure not only ensures that the Mark 2 has low inertia and hence high acceleration to get the job done quickly, but also that the temperature of the machine rapidly follows the temperature of the room, ideal when the CMM is not housed in a controlled environment. Temperature compensation in the software reports results as if they had been measured at 20°C/68°F.

The standard high-tech granite and aluminium table, originally developed for the optics industry, provides fantastic natural damping of high frequency vibration and the granite Y rail allows pre-loading of the bridge air bearings in both directions for superior accuracy.

Another unique feature of the MARK 2 is that manual machines can be easily upgraded to CNC at any point in the future, which is great if you are not sure of your requirement or perhaps can't initially justify the additional cost of a CNC machine.

Because of Fowler FUSION'S fully integrated manufacturing processes, the MARK 2 offers unbelievable value, but above all it is easy to use.

Key Features

- Shortest learning curve of any equivalent system
- Smallest overall footprint of any comparable size CMM
- Choice of Y axis sizes ranging from 600mm to 1500mm
- Suitable for the workshop environment
- Protection from environmental vibrations as standard
- Optimised friction free air bearings, aluminium bridge and granite table
- Free software upgrades - no maintenance fees or contracts

Machines Options

- Auto Temperature Compensation
- Touch Screen Joystick
- Industrial Joystick
- CCD Camera System
- Collimated Back Light Option
- Dual Monitor
- Fixture Kit



MARK 2 - Manual

Common Probe Options:

MARK 2 Manual

- TP8
- MH20i

MARK 2 CNC

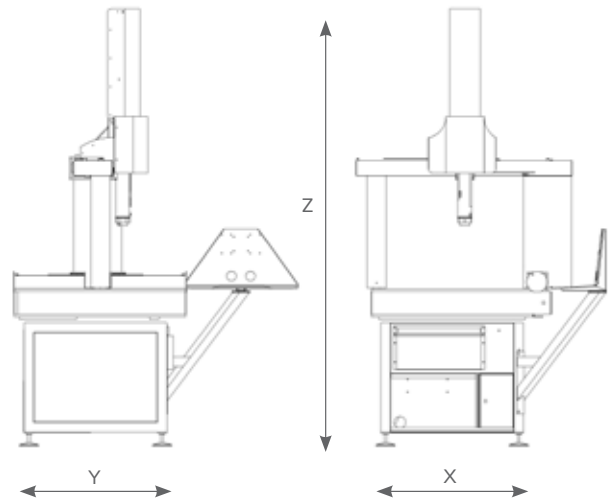
- RTP20
- PH10T (w/TP20, TP200)
- PH10M (w/SP25)
- PH6M (w/SP25)

MARK 2 Manual / CNC - CMM



Technical Specifications

Axis Travel (mm)	X 640 Y 600, 900, 1200, 1500 Z 500
Overall Size (mm)	X 1130 Y 900, 1200, 1500, 1800 Z 2320
*Volumetric Accuracy:	TP20 (2.4 + 0.4L/100) μm TP200 (2.3 + 0.4L/100) μm SP25M (2.1 + 0.4L/100) μm
Scale Resolution:	0.5 μm
**Optimum Temp Range:	18 - 22°C
Operational Temp Range:	0 - 45°C
Table:	Honeycomb aluminium & granite or solid granite
Table Load Capacity:	300kg (Honeycomb) or 500kg (Solid)
Max. Velocity Vector:	600mm/sec - CNC Units Only
Max. Acceleration Vector:	600mm/sec ² - CNC Units Only
Air Consumption:	50 l/min (1.8 cfm)
Required Air Pressure:	4 bar (60 psi)



*Maximum Permissible Error MPE_E according to 10360-2, 2009 within the thermal limits defined for optimum temperature range.

**Installation environment thermal limits:
Rate of change <1°C/hr and <2°C/24hr | Temperature gradient <1°C/m

MARK 2 - Manual / CNC

Part Number	Description	Table
Manual		
MK2-6-M-HG-PCM	MARK 2 Manual CMM - (X) 640mm x (Y) 600mm x (Z) 500mm	Honeycomb Aluminum and Granite
MK2-9-M-HG-PCM	MARK 2 Manual CMM - (X) 640mm x (Y) 900mm x (Z) 500mm	Honeycomb Aluminum and Granite
MK2-6-M-SG-PCM	MARK 2 Manual CMM - (X) 640mm x (Y) 600mm x (Z) 500mm	Solid Granite
MK2-9-M-SG-PCM	MARK 2 Manual CMM - (X) 640mm x (Y) 900mm x (Z) 500mm	Solid Granite
MK2-12-M-SG-PCM	MARK 2 Manual CMM - (X) 640mm x (Y) 1200mm x (Z) 500mm	Solid Granite
CNC		
MK2-6-C-HG-PCM	MARK 2 CNC CMM - (X) 640mm x (Y) 600mm x (Z) 500mm	Honeycomb Aluminum and Granite
MK2-9-C-HG-PCM	MARK 2 CNC CMM - (X) 640mm x (Y) 900mm x (Z) 500mm	Honeycomb Aluminum and Granite
MK2-6-C-SG-PCM	MARK 2 CNC CMM - (X) 640mm x (Y) 600mm x (Z) 500mm	Solid Granite
MK2-9-C-SG-PCM	MARK 2 CNC CMM - (X) 640mm x (Y) 900mm x (Z) 500mm	Solid Granite
MK2-12-C-SG-PCM	MARK 2 CNC CMM - (X) 640mm x (Y) 1200mm x (Z) 500mm	Solid Granite
MK2-15-C-SG-PCM	MARK 2 CNC CMM - (X) 640mm x (Y) 1500mm x (Z) 500mm	Solid Granite

CMM - MARK 2 HS High Specification

MARK 2 HS - High Specification

ELIMINATE INSPECTION BOTTLENECKS

Since 2004 the MARK 2HS CMM has been providing manufacturing industry with a fast and accurate solution for their measurement problems. But, as ever, Fowler Fusion are continually striving to improve the solutions which they offer. The Mark 2HS is both faster and more accurate than the standard model, and all without compromising the fantastic value for money for which FUSION has become known.

The MARK 2HS also utilises $0.1\mu\text{m}$ resolution scales on each axis. Incorporated with state-of-the-art error mapping techniques this means that the HS model is the most accurate FUSION CMM – ideal when measuring tight tolerances.

0.1 μm resolution scales fitted as standard



Key Features

- Fitted with 0.0001mm linear encoders for superior accuracy
- Angled bearing zero backlash drive system for quicker acceleration and faster travel
- Shortest learning curve of any equivalent system
- Choice of Y axis sizes ranging from 600mm to 1500mm
- Suitable for the workshop environment
- Protection from environmental vibrations as standard
- Optimised friction free air bearings, aluminium bridge and granite table
- Free software upgrades - no maintenance fees or contracts

Machines Options

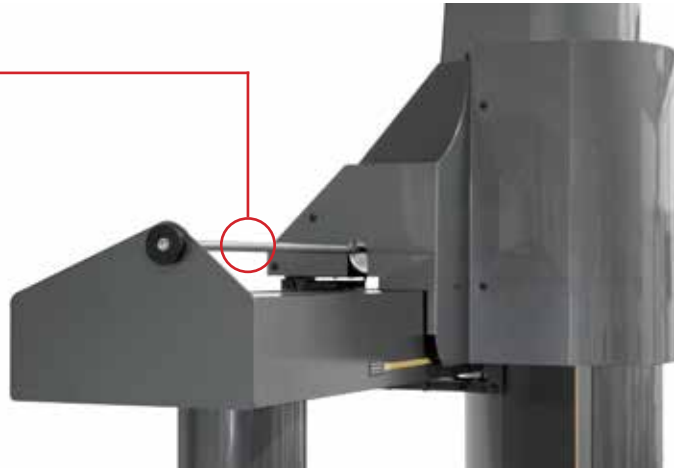
- Auto Temperature Compensation
- Touch Screen Joystick
- Industrial Joystick
- CCD Camera System
- Collimated Back Light Option
- Dual Monitor
- Fixture Kit

Common Probe Options

- RTP20
- PH10T (w/TP20, TP200)
- PH10M (w/SP25)
- PH6M (w/SP25)

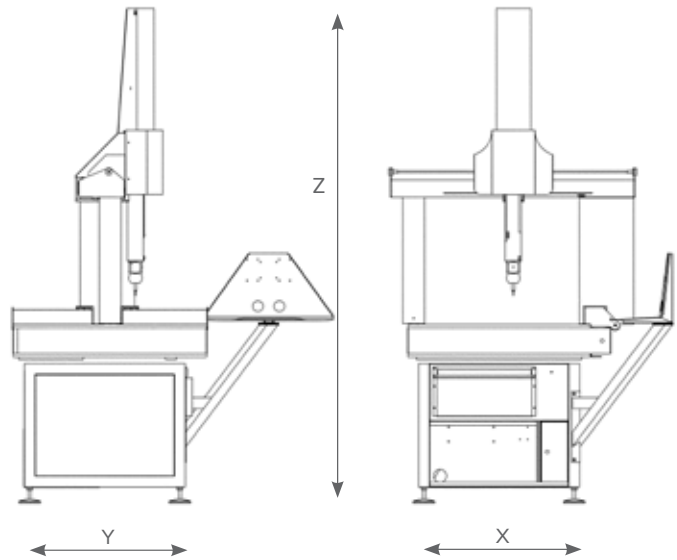
MARK 2 HS High Specification - CMM

Rather than using the belt drive system, the MARK 2HS incorporates drive rod technology developed on our larger machines and vision products. This allows even greater accelerations to be achieved meaning that the HS model measures approximately 20% quicker than the standard variant – ideal for high volume measurement.



Technical Specifications

Axis Travel (mm)	X 640 Y 600, 900, 1200, 1500 Z 500
Overall Size (mm)	X 1130 Y 900, 1200, 1500, 1800 Z 2320
*Volumetric Accuracy:	TP20 (2.1 + 0.4L/100) μm TP200 (2.0 + 0.4L/100) μm SP25M (1.8 + 0.4L/100) μm
Scale Resolution:	0.1 μm
**Optimum Temp Range:	18 - 22°C
Operational Temp Range:	0 - 45°C
Table:	Honeycomb aluminium & granite or solid granite
Table Load Capacity:	300kg (Honeycomb) or 500kg (Solid)
Max. Velocity Vector:	866mm/sec
Max. Acceleration Vector:	1200mm/sec ²
Air Consumption:	50 l/min (1.8 cfm)
Required Air Pressure:	4 bar (60 psi)



*Maximum Permissible Error MPE_E according to 10360-2, 2009 within the thermal limits defined for optimum temperature range.

**Installation environment thermal limits:
Rate of change <1°C/hr and <2°C/24hr | Temperature gradient <1°C/m

MARK 2 HS - High Specification

Part Number	Description	Table
MK2-6-HS-HG-PCM	MARK 2HS CMM - (X) 640mm x (Y) 600mm x (Z) 500mm	Honeycomb Aluminum and Granite
MK2-9-HS-HG-PCM	MARK 2HS CMM - (X) 640mm x (Y) 900mm x (Z) 500mm	Honeycomb Aluminum and Granite
MK2-6-HS-SG-PCM	MARK 2HS CMM - (X) 640mm x (Y) 600mm x (Z) 500mm	Solid Granite
MK2-9-HS-SG-PCM	MARK 2HS CMM - (X) 640mm x (Y) 900mm x (Z) 500mm	Solid Granite
MK2-12-HS-SG-PCM	MARK 2HS CMM - (X) 640mm x (Y) 1200mm x (Z) 500mm	Solid Granite
MK2-15-HS-SG-PCM	MARK 2HS CMM - (X) 640mm x (Y) 1500mm x (Z) 500mm	Solid Granite

CMM - MARK 4

MARK 4

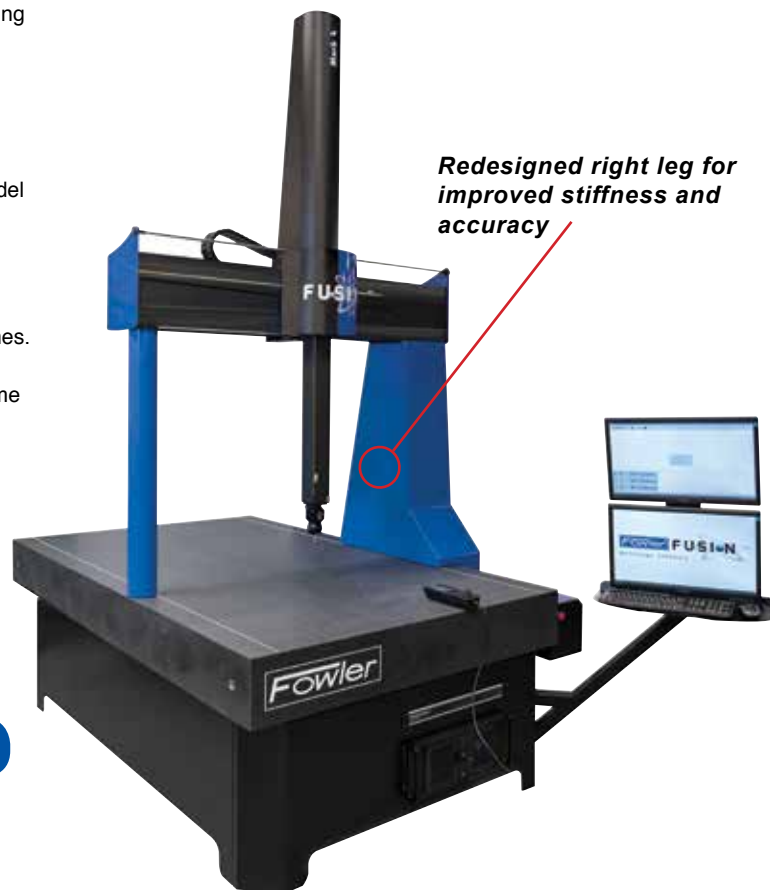
LARGE AFFORDABLE PRECISION

The MARK 4 CMM is the result of a design evolution of the award winning range of machines. Many of the design improvements revolve around the right leg of the machine, which has been modelled on the hugely successful MARK 5 machine.

Greater air bearing separation results in greater stiffness, and so has improved the accuracy significantly. The first term error for this new model is more than a micron better.

All moving parts are light and this, combined with good design, means that the MARK 4 has low inertia and therefore optimal acceleration characteristics. The improved MARK 4 is fast, minimising inspection times.

The MARK 4 range is the best value-for-money for the measuring volume of any CMM available in the market - the perfect affordable metrology solution for big and heavy parts.



Redesigned right leg for improved stiffness and accuracy

Key Features

- Shortest learning curve of any equivalent system
- Smallest overall footprint of any comparable size CMM
- Choice of Y axis sizes ranging from 1000mm to 3000mm
- Suitable for the workshop environment
- Optimised friction free air bearings, aluminium bridge and granite table
- Supplied with the CMM touch screen joystick as standard
- Free software upgrades - no maintenance fees or contracts

Machines Options

- 4400Kg load capacity
- Auto Temperature Compensation
- CCD Camera System
- Collimated Back Light Option
- Dual Monitor
- Fixture Kit

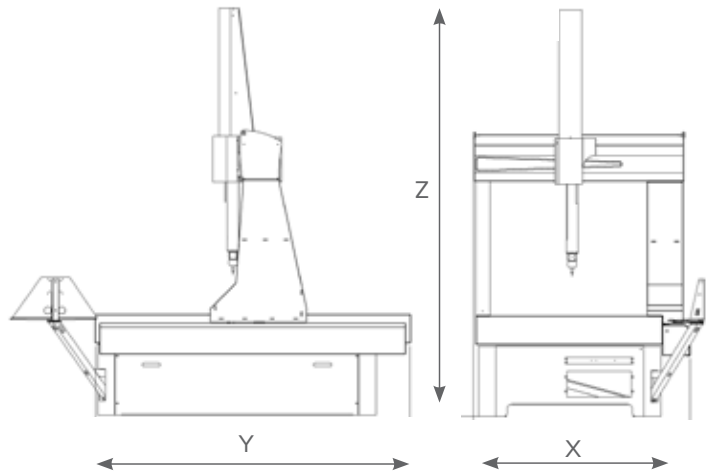
Common Probe Options

- RTP20
- PH10T (w/TP20, TP200)
- PH10M (w/SP25)
- PH6M (w/SP25)



Technical Specifications

Axis Travel (mm)	X 1000 Y 1000, 1500, 2000, 2500, 3000 Z 600, 800
Overall Size (mm)	X 1520 Y 1700, 2200, 2700, 3200, 3700 Z 2500, 2900
*Volumetric Accuracy:	TP20 (2.7 + 0.4L/100) μm TP200 (2.6 + 0.4L/100) μm SP25M (2.4 + 0.4L/100) μm
Scale Resolution:	0.5 μm
**Optimum Temp Range:	18 - 22°C
Operational Temp Range:	0 - 45°C
Table:	Granite
Table Load Capacity:	1500kg as standard. Options up to 4400kg
Max. Velocity Vector:	600mm/sec
Max. Acceleration Vector:	600mm/sec ²
Air Consumption:	50 l/min (1.8 cfm)
Required Air Pressure:	4 bar (60 psi)



*Maximum Permissible Error MPE_E according to 10360-2, 2009 within the thermal limits defined for optimum temperature range.

**Installation environment thermal limits:
Rate of change <1°C/hr and <2°C/24hr | Temperature gradient <1°C/m

MARK 4

Part Number	Description
MK4-ZN3-106-SG-PCM	MARK 4 CMM - (X) 1000mm x (Y) 1000mm x (Z) 600mm
MK4-ZN3-108-SG-PCM	MARK 4 CMM - (X) 1000mm x (Y) 1000mm x (Z) 800mm
MK4-ZN3-156-SG-PCM	MARK 4 CMM - (X) 1000mm x (Y) 1500mm x (Z) 600mm
MK4-ZN3-158-SG-PCM	MARK 4 CMM - (X) 1000mm x (Y) 1500mm x (Z) 800mm
MK4-ZN3-206-SG-PCM	MARK 4 CMM - (X) 1000mm x (Y) 2000mm x (Z) 600mm
MK4-ZN3-208-SG-PCM	MARK 4 CMM - (X) 1000mm x (Y) 2000mm x (Z) 800mm
MK4-ZN3-256-SG-PCM	MARK 4 CMM - (X) 1000mm x (Y) 2500mm x (Z) 600mm
MK4-ZN3-258-SG-PCM	MARK 4 CMM - (X) 1000mm x (Y) 2500mm x (Z) 800mm
MK4-ZN3-306-SG-PCM	MARK 4 CMM - (X) 1000mm x (Y) 3000mm x (Z) 600mm
MK4-ZN3-308-SG-PCM	MARK 4 CMM - (X) 1000mm x (Y) 3000mm x (Z) 800mm

CMM - MARK 5

MARK 5

FROM STRENGTH TO STRENGTH

As CMMs get larger, it is not simply a case of scaling up the design of smaller models. Stiffness of the structure is critical, but weight must also be kept to a minimum. The MARK 5 CMM is not only Fowler's largest in their range of CMM products, but it is the culmination of experience and excellence in the design and manufacture of innovative metrology equipment incorporating the very latest materials technology.

The revolutionary bridge of the MARK 5 incorporates aluminium honeycomb sheets developed for use in formula one and the aerospace industry. The remarkable stiffness to weight ratio that this provides gives the MARK 5 an edge in both performance and speed. For a machine of this size, the MARK 5 is not only fast, but extremely accurate.

The drive systems designed for the MARK 5 offer simplicity and reliability and the novel system used on the Y axis ensures that there is no degradation of performance across the full range of machine sizes offered up to 3m.

A big machine should also be able to measure a heavy component and this is another area where Fowler has applied innovative thinking. Rather than simply increasing the depth of the granite table, which adds huge cost and weight to the machine, we offer a specially designed load plate to sit on the granite base. This plate can accept up to a six tonne load which will then be transmitted directly through the feet of the machine bench directly to the floor, meaning no loss of metrology performance.

Key Features

- Capable of measuring parts up to 6000kg in weight
- Fitted with 0.0001mm linear encoders for superior accuracy
- Unique self-contained drive system ensures excellent performance over the entire measuring volume
- Choice of Y axis sizes ranging from 1000mm to 3000mm
- Supplied with the CMM touch screen joystick as standard
- Free software upgrades - no maintenance fees or contracts

Machines Options

- Load plate for loads up to 6 tonnes
- Auto Temperature Compensation
- CCD Camera System
- Collimated Back Light Option
- Dual Monitor
- Fixture Kit



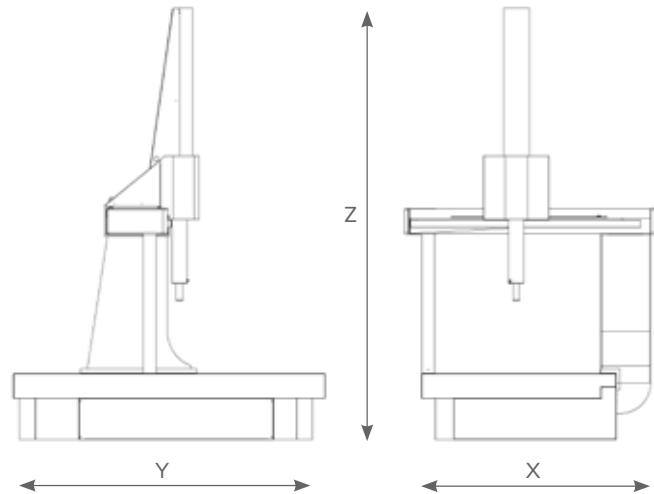
Common Probe Options

- PH10T (w/TP20, TP200)
- PH10M (w/SP25)
- PH6M (w/SP25)



Technical Specifications

Axis Travel (mm)	X 1200 Y 1000, 1500, 2000, 2500, 3000 Z 1000
Overall Size (mm)	X 1940 Y 2000, 2500, 3000, 3500, 4000 Z 3595
*Volumetric Accuracy:	TP20 (2.9 + 0.4L/100) μm TP200 (2.8 + 0.4L/100) μm SP25M (2.6 + 0.4L/100) μm
Scale Resolution:	0.1 μm
**Optimum Temp Range:	18 - 22°C
Operational Temp Range:	0 - 45°C
Table:	Granite
Table Load Capacity:	1500kg as standard. Options up to 6000kg
Max. Velocity Vector:	650mm/sec
Max. Acceleration Vector:	850mm/sec ²
Air Consumption:	50 l/min (1.8 cfm)
Required Air Pressure:	4 bar (60 psi)



*Maximum Permissible Error MPE_E according to 10360-2, 2009 within the thermal limits defined for optimum temperature range.

**Installation environment thermal limits:
Rate of change <1°C/hr and <2°C/24hr | Temperature gradient <1°C/m

MARK 5

Part Number	Description
MK5-10-SG-PCM	MARK 5 CMM - (X) 1200mm x (Y) 1000mm x (Z) 1000mm
MK5-15-SG-PCM	MARK 5 CMM - (X) 1200mm x (Y) 1500mm x (Z) 1000mm
MK5-20-SG-PCM	MARK 5 CMM - (X) 1200mm x (Y) 2000mm x (Z) 1000mm
MK5-25-SG-PCM	MARK 5 CMM - (X) 1200mm x (Y) 2500mm x (Z) 1000mm
MK5-30-SG-PCM	MARK 5 CMM - (X) 1200mm x (Y) 3000mm x (Z) 1000mm

CMM - Probe Options



Every bridge-type FUSION CMM fully supports the range of probe heads and both touch trigger and scanning probes supplied by Renishaw. The following are common options:

TP8 Probe - supplied as standard

The TP8 probe offers an entry level option for customers that require infrequent indexing of the probe and no indexing during the running of a measurement programme. The TP8 is supplied with two knuckle joints to allow infinite alignment of the probe to the feature being measured, but this alignment is non-repeatable, meaning that the stylus will need to be requalified following each index. The TP8 probe accepts the M3 range of styli.



MH20i Probe Head

The MH20i probe offers repeatable manual indexing of the probe head from 0° to 90° in the A axis and through 360° in the B axis, in 15° increments. Ideal for manual CMMs, it can also be used on CNC models, but will require intervention from the operator whenever indexing is required. The MH20i uses a TP20 stylus module, which in turn accepts the M2 range of styli.



Part Number: MH20i

RTP20 Probe Head

The RTP20 probe offers a really cost effective solution for customers that require automatic indexing on CNC machines. Modelled on the MH20i body, the RTP20 uses the CNC motion of the CMM to position itself using a post mounted to the bed of the machine. Like the MH20i it is able to index from 0° to 90° in the A axis and through 360° in the B axis, in 15° increments and uses a TP20 stylus module, which in turn accepts the M2 range of styli. The RTP20 is also fully compatible with the MCR20 change rack to provide an option that provides both automatic stylus changing as well as automatic indexing.



Part Number: RTP20

PH10T Probe Head

The PH10T is a fully motorised probe head that offers immediate indexing from 0° to 105° in the A axis and through 360° in the B axis, in 7.5° increments. This probe head should be used by customers requiring frequent indexing or when more precise alignment to the features being measured is required.

Common probe options for the PH10T:

TP20

The TP20 is a robust probe for general purpose measurement that can be used in conjunction with the MCR20 change rack to facilitate automatic stylus changing. The TP20 stylus modules can be supplied with different trigger forces which accept M2 styli up to 60mm long, and with different length modules to assist with probing at greater depths.

Part Number: PH10T-TP20

TP200

The TP200 probe utilises strain gauge technology and so does not exhibit lobing characteristics and therefore should be considered by customers requiring more accurate measurement of form. It can be used with the SCR200 change rack for automatic stylus changing and the TP200 modules are available as standard or low force for use with M2 styli up to 100mm long.

Part Number: PH10T-TP200



PH10T probe head fitted with TP20 probe

Probe Options - CMM



PH10M with SP25M scanning probe

PH10M Probe Head

Like the PH10T probe head, the PH10M is also a fully motorised probe head that offer immediate indexing from 0° to 105° in the A axis and through 360° in the B axis, in 7.5° increments. The M head, however, incorporates an autojoint with multiwire capability, which is necessary for the SP25M scanning probe. The PH10M probe head can also be fitted with either TP20 or TP200 probes and should be chosen in preference to the PH10T when using these probes if the future use of a scanning technology may be required.

Part Numbers: PH10M-TP20
PH10M-TP200



PH6M with SP25M scanning probe

PH6M Probe Head

This head provides a fixed autojoint for when an SP25M scanning probe is needed without the requirement for indexing.

Part Numbers: PH6M-SP25-FCR
PH6M-SP25-MRS

SP25M Scanning Probe

The SP25M scanning probe uses an isolated optical metrology transducer system to enable extremely accurate measurements to be taken with the stylus in continuous contact with the feature being inspected. This enables more data to be taken which is important when form is critical. A range of modules are available for the SP25M to provide optimised scanning performance using M3 styli up to 400mm long.

Part Numbers: PH10M-SP25-FCR
PH10M-SP25-MRS

Probe Comparison

	Integral Probe	Index Motion	Maximum Length	Index Resolution	Index Positions	Repeatable Indexing	Repeatable Stylus Charging
TP8	Yes	Manual	105mm	Infinite	Infinite	No	No
MH20i	Yes	Manual	150mm	15°	168	Yes	Yes
RTP20	Yes	Automated	168mm	15°	168	Yes	Yes
PH10T	No	Motorised	450mm	7.5°	720	Yes	Yes
PH6M	No	No	450mm	No	No	No	Yes
PH10M	No	Motorised	450mm	7.5°	720	Yes	Yes

CMM - Accessories

ACCESSORIES

FURTHER CMM ENHANCEMENTS

CMM Touch Screen Joystick

The touch screen joystick gives you control of the FUSION 3D inspection software and the 3-axis machine motion from an easy to operate handheld device.

The CMM touch screen joystick allows users complete control of the FUSION 3D inspection software, clearly displayed through the unique joystick graphical user interface and high resolution touch sensitive screen - there is no need to interface with the PC. This is especially useful on larger CMMs when you need to stand over the part or around the back of the machine, to position the probe or clearly see probe measurements.

The colour touch screen joystick is invaluable when creating and running inspection programs, enabling complete control of the X, Y and Z-axis machine movement, probe head indexing and machine status.- You have complete control at your fingertips.

The touch screen joystick is supplied as standard with both the MARK 4 and MARK 5 CMMs.



Part Number: DEVA031

Industrial CMM Joystick

The industrial CMM joystick is a robust lower-cost version of the acclaimed CMM touch-screen joystick. It has full X-Y-Z axis motion control, X-Y-Z +/- direction measurement capability, feed rate override and the ability to insert Move Via points as required. The industrial joystick has been ergonomically designed for left or right handed operation, and includes a magnetic mount to enable quick placement on the CMM.



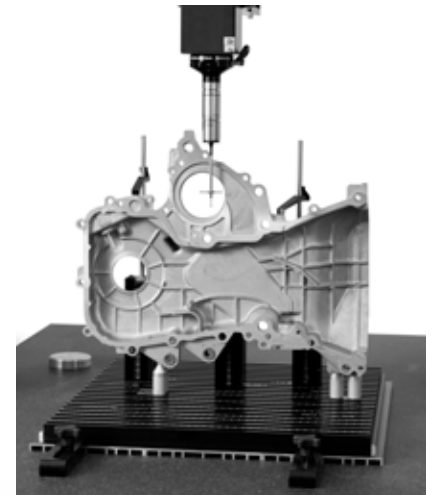
Part Number: DEVA044

Fixture Kit

Patent pending T-slot and T-nut technology provides infinite adjustment of the fixture components in multiple directions. Clamps, locators and supports can be placed in exactly the right position to suit the part. Greater flexibility results in less complicated designs, fixtures are easier to assemble and completed in less time.

Fixture mountings incorporate one or more t-slot. The slot receives a sliding t-nut which is used to secure the fixture components in place. For rapid repeat set-ups, fixture components can be removed and replaced without disturbing the t-nut while laser engraved scales and alpha markings facilitate more precise builds.

Any number of designs can be created from a single fixture kit. Over one hundred high quality parts manufactured from anodised aluminium and stainless steel are supplied in a compartmented storage case. All types of prismatic and free form parts can be held and supported correctly during measurement.



FIXTURE KITS

Part Number	Description
FP-S	300mm x 450mm Fixture Base
FP-M	450mm x 450mm Fixture Base
FP-L	600mm x 450mm Fixture Base



Automation Interface Unit

The FUSION automation interface adds the capability for FUSION 3D programs to be remotely controlled and monitored using an external system allowing any FUSION CMM to be integrated with an automated component handling system, whether this be a fully controlled, PLC driven manufacturing system, a robotic loader or just an automatic bar feeder. The package comprises of an optically isolated digital I/O system and a software module that enables the software to be setup to follow a defined operating sequence to allow the automated operation.

The automation interface includes documentation and a software utility package, but because of the need to have detailed knowledge for the automated handling system for each installation, integration must be handled by the system integrator and cannot be supported by Fowler FUSION.



Part Number: AUTOM-IF

Collimated Back Light

The CMM collimated light enables backlight illumination of 3D or turned components when used with the CMM Camera System. When using collimated light to backlight components, a clear and crisp silhouette, similar to using a profile projector, is produced. A single-LED collimated light features a compact, lightweight design which is perfect for the MARK 2 range of CMMs and is fully programmable and controllable within FUSION vision software.



Part Number: COL-BL-120

Automatic Temperature Compensation

The FUSION Temperature Compensation option enables your CMM to maintain accuracy in an uncontrolled environment, such as on the shop floor.

In an ideal world, your CMM would be installed in a perfectly temperature controlled room. However, in the real world of manufacturing, sometimes that isn't possible or practical because you need your CMM next to where your parts are being made.

A USB temperature sensor embedded in the bridge of the CMM provides feedback to compensate as though measurements have been taken at 20°C



Part Number: AUTO-TEMP

Dual Monitor

The vertically mounted dual-monitor arm enables FUSION CAD or Vision software modules to be viewed on a separate tiltable screen to the FUSION 3D inspection software.



Part Number: DUAL-MON

Air Dryer

To ensure a good quality air supply and maximise the performance and life of the CMM, an air dryer is highly recommended.

Contact Fowler Sales Department for more information 1-800-788-2353



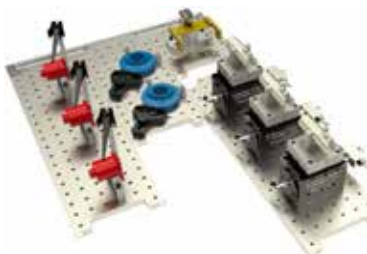
FUSION Software

Part Number	Description
54-950-106-0	FUSION 3D CAD Comparison Module
54-950-106-1	FUSION 3D CAD Comparison Module - Off-line
54-950-107-0	FUSION Programming from CAD Module
54-950-107-1	FUSION 3D Programming from CAD Module - Off-line
54-950-108-0	FUSION 3D Geometric Measurement Software

MARK CMM - Loc-N-Load™ Fixture Systems

Choose Loc-N-Load™ for traditional CMMs, Optical Comparators and Gage Arms

Loc-N-Load™ Fixture Systems



Inch 1/4-20

Clear Anodized Aluminum
1x1" hole pattern, 1/2" thick

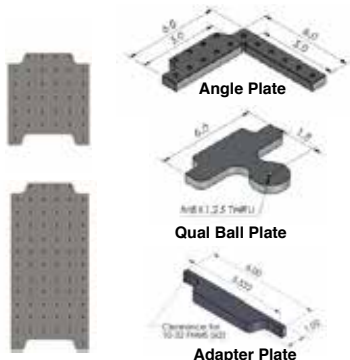
Part Number	Description
SYS05_DK12TR03	CMM 12" Dock, Plates + 58 pc Starter Kit
SYS05_DK12TR02	CMM 12" Dock, Plates + 70 pc Complete Kit
SYS05_DK12TR01	CMM 12" Dock, Plates + 146 pc Works Kit
SYS10_DK18TR03	CMM 18" Dock, Plates + 58 pc Starter Kit
SYS10_DK18TR02	CMM 18" Dock, Plates + 70 pc Complete Kit
SYS10_DK18TR01	CMM 18" Dock, Plates + 146 pc Works Kit
SYS20_DK30TR03	CMM 30" Dock, Plates + 58 pc Starter Kit
SYS20_DK30TR02	CMM 30" Dock, Plates + 70 pc Complete Kit
SYS20_DK30TR01	CMM 30" Dock, Plates + 146 pc Works Kit
SYS60_OC6TR03	Optical Comparator 6" Dock/Plates+ 58 pc Starter
SYS60_DK24TR02	Gage Arm 24" Dock/Plates +70 pc Complete Kit

Metric M6

Clear Anodized Aluminum
20x20mm hole pattern, 12.7mm

Part Number	Description
SYSM1_DK360TR03	CMM 360mm Dock, Plates + 58 pc Starter Kit
SYSM1_DK360TR02	CMM 360mm Dock, Plates + 70 pc Complete Kit
SYSM1_DK360TR01	CMM 360mm Dock, Plates + 139 pc Works Kit
SYSM2_DK540TR03	CMM 540mm Dock, Plates + 58 pc Starter Kit
SYSM2_DK540TR02	CMM 540mm Dock, Plates + 70 pc Complete Kit
SYSM2_DK540TR01	CMM 540mm Dock, Plates + 139 pc Works Kit
SYSM3_DK720TR03	CMM 720mm Dock, Plates + 58 pc Starter Kit
SYSM3_DK720TR02	CMM 720mm Dock, Plates + 70 pc Complete Kit
SYSM3_DK720TR01	CMM 720mm Dock, Plates + 139 pc Works Kit
SYS60M_OC180TR03	Optical Comparator 180mm Dock/Plates+ 58 pc Starter
SYS60M_DK540TR02	Gage Arm 540mm Dock/Plates +70 pc Complete Kit

Loc-N-Load™ ALUMINUM - Individual Rails, Plates and Speciality Plates



Loc-N-Load™ ALUMINUM

Speciality Plates

Part Number	Description
Inch - 1/4-20	
LNL-ADPT-06	Adapter Plate
LNL-ANGL-0603	Angle Plate
LNL-QUAL-PLT	Qualifying Ball Plate
LNL-0606-4X	Indexable Plate
LNL-RND-0608	Radial Plate
Metric - M6	
LNL-ADPT-M6	Adapter Plate
LNL-ANGL-M6	Angle Plate
LNL-QUAL-PLT-M	Qualifying Ball Plate

Radial/Indexable Plates

Part Number	Description	Metric - M6
Inch - 1/4-20		
LNL-DOCK-12	12" Dock	LNL-DOCK-M360 360 Dock
LNL-DOCK-18	18" Dock	LNL-DOCK-M540 540 Dock
LNL-DOCK-30	30" Dock	LNL-DOCK-M720 720 Dock
LNL-PLT-0606	6x6" Plate	LNL-M180180 180x180 Plate
LNL-PLT-0612	6x12" Plate	LNL-M180360 180x360 Plate
LNL-PLT-0618	6x18" Plate	LNL-M360360 160x360 Plate
LNL-PLT-1212	12x12" Plate	LNL-M360540 360x540 Plate
LNL-PLT-1218	12x18" Plate	
LNL-PLT-1818	18x18" Plate	
LNL-PLT-1824	18x24" Plate	

Vises and Speciality Work Holding

Rapid-Loc™ & Modular Tower

Part Number	Description
Inch - 1/4-20	
RL-VISE-SYS02	Rapid-Loc™ Vise System
MT2-SYS-01	Modular Tower System
Metric - M6	
RLM-ADAPT-02	Base Plate Adapter for METRIC Rapid-Loc™



Rapid-Loc™ & Riser-Grip™

Part Number	Description
Inch - 1/4-20	
SC-06-03	3 Leg 6" Spider Clamp
SC-06-01	1 Leg 3" Spider Clamp
SP-VISE-2.50	Spanner Vice, 2pc.
CC-ER11	ER Collet Chuck
CC-ER16	ER Collet Chuck, flanged
RG-2.75	Riser-Grip™, adjustable
Metric - M6	
SC-06-03-M	3 Leg 6" Spider Clamp
SC-06-01-M	1 Leg 3" Spider Clamp
RG-2.75	Riser-Grip™, adjustable

Speciality Work Holding and Featured Products

Radial Plate

Perfect for holding round parts. Laser marked rings make aligning easy.

Part Number: LNL-RND-0608



Indexable Plate

Great for inspecting complex parts. Turn and lock plate to access hard to reach features.

Part Number: LNL-0606-4x



Spider-Clamp™ 3-Legged

Hold round parts from 1.18" to 6" in dia. Delicate parts held without distortion. great vision inspection.

Part Number: SC-06-03



Spider-Clamp™ 1-Legged

Use several of these 3" clamps to hold parts of infinite size and shape.

Part Number: SC-06-01



Spanner-Vise™

2-piece vise can infinitely adjust to accommodate workpiece - lock down securely.

Part Number: SP-VISE-2.5



ER11 & ER16 Collet Chucks

Hold small dia. parts and create multi-part fixtures. Opening from 0.012"-0.312" and from 0.012"-0.416". ER16 is flanged for greater stability

Part Numbers: CC-ER11

CC-ER16



Sturdy Lever Clamp

2.5" length provides up to 30lbs. of force for larger parts.

Part Number: LC-2.50



Vision Corner Block

Allows complete view of the part on a vision stage.

Part Number: VCB-150M



Work Holding Kits and Sets

Work Holding Kits & Sets

Part Number	Description
Inch - 1/4-20	
TR-KIT-03	Starter Kit - 58pcs.
TR-KIT-02	Complete Kit - 70pcs.
TR-KIT-01	Works Kit - 146pcs.
MAGN-SET-30	Magnetic Riser Set - 23pcs.
STOF-SET-30	Stand-Off & Rest Pad - 37pcs.
STOFE-SET-30	Enhanced Stand-Off - 16pcs.
Metric - M6	
TR-KIT-03M	Starter Kit - 58pcs.
TR-KIT-02M	Complete Kit - 70pcs.
TR-KIT-01M	Works Kit - 146pcs.
MAGN-SET-30M	Magnetic Riser Set - 23pcs.
STOF-SET-30M	Stand-Off & Rest Pad - 37pcs.
STOFE-SET-30M	Enhanced Stand-Off - 16pcs.





baty

HIGH PRECISION

OPTICAL INSTRUMENTS VISION SYSTEMS



VISION SYSTEM - VuMaster

Fowler 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, expertly 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 - 16"/400mm x 12"/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.

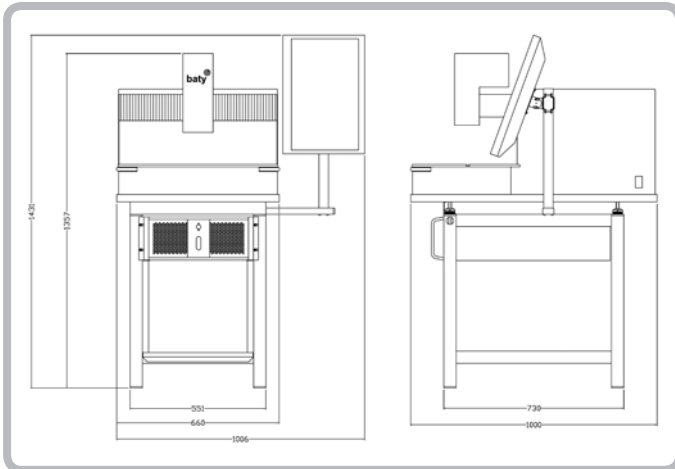
Finally, multiple reports can be generated automatically including SPC charts, Excel compatible tabulate and multiple component and fully dimensional drawing of measured part.

Features:

- Large 15.7"/400mm x 11.8"/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
- Motorized autofocus
- Image grab
- Auto inspection playback
- CNC and Manual models available
- Off line programming from DXF
- Scanning tool with DXF compare function for profile measurement
- Image stitching allows full part to be reviewed in the camera window



54-403-001-0



VUMASTER

Part Number	Description
54-403-001-0	VuMaster Manual including 22" LCD monitor
54-403-005-0	VuMaster CNC including 22" LCD monitor
54-251-500-0	Glass calibration artifact (1 included)

Venture Touch - VISION SYSTEM

Fowler 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 Fowler Baty's 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, at a manual system price.

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
- Motorized autofocus for z-axis measurement

54-303-250-0



VENTURE TOUCH

Part Number	Description
54-251-150-0	Venture Touch - 2510, Venture manual with motorized Z and autofocus, Fusion Touch software, 9.8"/250mm x 4.9"/125mm x 6.1"/155mm X,Y, Z measuring range
54-303-250-0	Venture Touch - 3030, Venture manual with motorized Z and autofocus, Fusion Touch software, 11.8"/300mm x 11.8"/300mm x 7.8"/200mm X,Y, Z measuring range
54-251-500-0	Glass calibration artifact (1 included)
54-251-550-0	All steel machine stand with granite top (not included)

VISION SYSTEM - Venture XT CNC

Fowler Baty Vision Systems - Venture XT CNC

Venture XT CNC models take the power of Fusion software one stage further by completely automating the inspection process. Using a combination of non-contact (camera) and contact (touch probe) methods, advanced measurements including scanning and best fitting can be completed in a single automated inspection, 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. CNC programs can also be created offline from CAD models.

Large Measurement Volume

The use of a touch probe is optimized 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. This provides a truly universal measuring instrument combining the capabilities of a CMM, optical comparator, microscope and visual inspection in one compact instrument.

A probe changer rack can be installed so that the 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.

Programming using the touch probe is easy, simply probe each element of the part using the minimum of points to create a program template. This process can be done at the machine using the actual part, or off-line using a CAD model. Measurements made using the camera are also automatically added to the current inspection program. Unique conditions are saved with each measurement so each element is measured in exactly the same way (lighting, edge detection settings etc.) for every part in a batch.

Standard CNC system features include:

- Teach and repeat programming
- Programmable segmented LED lighting
- 6.5:1 zoom optics (with optional CNC control)
- Zoom lens error mapping for increased accuracy in the field of view
- Optional 12x zoom optics
- High resolution 0.5µm scales for increased accuracy
- CAD import/export
- Scanning and best fitting - contact and non-contact
- Fully dimensioned part view
- SPC included
- Excel™ compatible reports
- Autofocus
- 6.3"/160mm or 7.8"/200mm Z axis measuring range on adjustable dovetail slide
- 9.8"/250mm x 4.9"/125mm and 11.8"/300mm x 11.8"/300mm XY stages available
- 2D and 3D program from CAD
- Image stitching allows full part to be reviewed in the camera window



VENTURE XT

Part Number	Description
54-251-200-0	Venture XT 2510 - CNC, Venture XT CNC with Fusion 3D software, 9.8"/250mm x 4.9"/125mm x 6.1"/155mm XYZ stage, includes controller and 2, 19" monitors
54-251-205-0	Venture XT 2510 - CNC, Venture XT CNC with Fusion 3D software, 9.8"/250mm x 4.9"/125mm x 6.1"/155mm XYZ stage, includes controller and 2, 19" monitors, TP20 touch probe and CNC zoom lens
54-303-300-0	Venture XT 3030 - CNC, Venture XT CNC with Fusion 3D software, 11.8"/300mm x 11.8"/300mm x 7.9"/200mm XYZ stage, includes controller and 2, 19" monitors
54-242-000-0	Venture XT 3030 - CNC, Venture XT CNC with Fusion 3D software, 11.8"/300mm x 11.8"/300mm x 7.9"/200mm XYZ stage, includes controller and 2, 19" monitors, TP20 touch probe kit and CNC zoom lens
54-242-500-0	Venture XT 3030 - CNC, Venture XT CNC with Fusion 3D software, 11.8"/300mm x 11.8"/300mm x 7.9"/200mm XYZ stage, includes controller and 2, 19" monitors, SP25 touch probe kit and CNC zoom lens
54-251-500-0	Glass calibration artifact (1 included)

Venture XT CNC - VISION SYSTEM

Standard lighting options included on all Venture Systems

- Programmable segmented 64 LED surface light ring
- Collimated profile light
- Coaxial (TTL) light

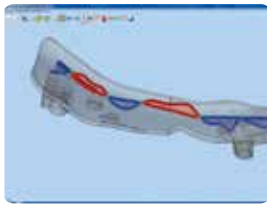


Fowler Baty's Programmable segmented LED lighting

Venture Options

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.



54-303-314-0

Touch probe inspection programs can be created before the part is even manufactured by using the CAD model to define the features to be measured. The CNC program template is then created with all the necessary XYZ moves calculated. This facility can also be used for offline programming on a remote PC.



54-303-196-0

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



54-303-016-0

Probe module change rack
6 port



54-250-550

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



54-303-200-0

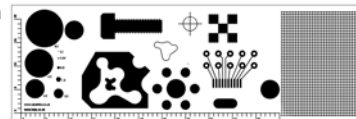
Universal fixture base provides fixture mounting slots compatible with all projector accessories

VENTURE OPTIONS

Part Number	Description
54-303-314-0	CAD comparison software
54-950-107-0	Program from CAD software
54-303-016-3	Probe module change rack - 6 port
54-303-196-0	Dual vee block and centers
54-303-200-0	Universal fixture base
54-251-500-0	Glass calibration artifact
54-251-550-0	All steel machine stand with granite top

54-251-500-0

Included with every Venture is this calibration standard with nominal diameters for field of view measurement verification and pixel calibration



VISION SYSTEM - Venture PLUS

Fowler Baty Vision Systems - Venture PLUS

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

Large Measurement Volume

The Venture PLUS is available in four models:

54-303-646-0

25.2"/640mm x 11.2"/600mm x 9.8"/250mm measuring range

54-303-649-0

25.2"/640mm x 35.4"/900mm x 9.8"/250mm measuring range

54-303-110-0

39.4"/1000mm x 39.4"/1000mm x 15.7"/400mm measuring range

54-303-150-0

39.4"/1000mm x 59"/1500mm x 15.7"/400mm 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 the Venture PLUS ideal for use on the shop floor.

Standard CNC system features include:

- Teach and repeat programming
- Programmable segmented LED lighting
- 6.5:1 zoom optics (with optional CNC control)
- Zoom lens error mapping for increased accuracy in the field of view
- Optional 12x zoom optics
- High resolution 0.5 μ m scales for increased accuracy
- CAD import/export
- Scanning and best fitting - contact and non-contact
- Fully dimensioned part view
- SPC included
- Excel™ compatible reports
- Autofocus
- 6.3"/160mm or 7.8"/200mm Z axis measuring range on adjustable dovetail slide
- 9.8"/250mm x 4.9"/125mm and 11.8"/300mm x 11.8"/300mm XY stages available
- 2D and 3D program from CAD
- Image stitching allows full part to be reviewed in the camera window
- Multi-function joystick with color touch screen

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:

- 12:1 zoom optics
- Renishaw SP25 scanning probe

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.

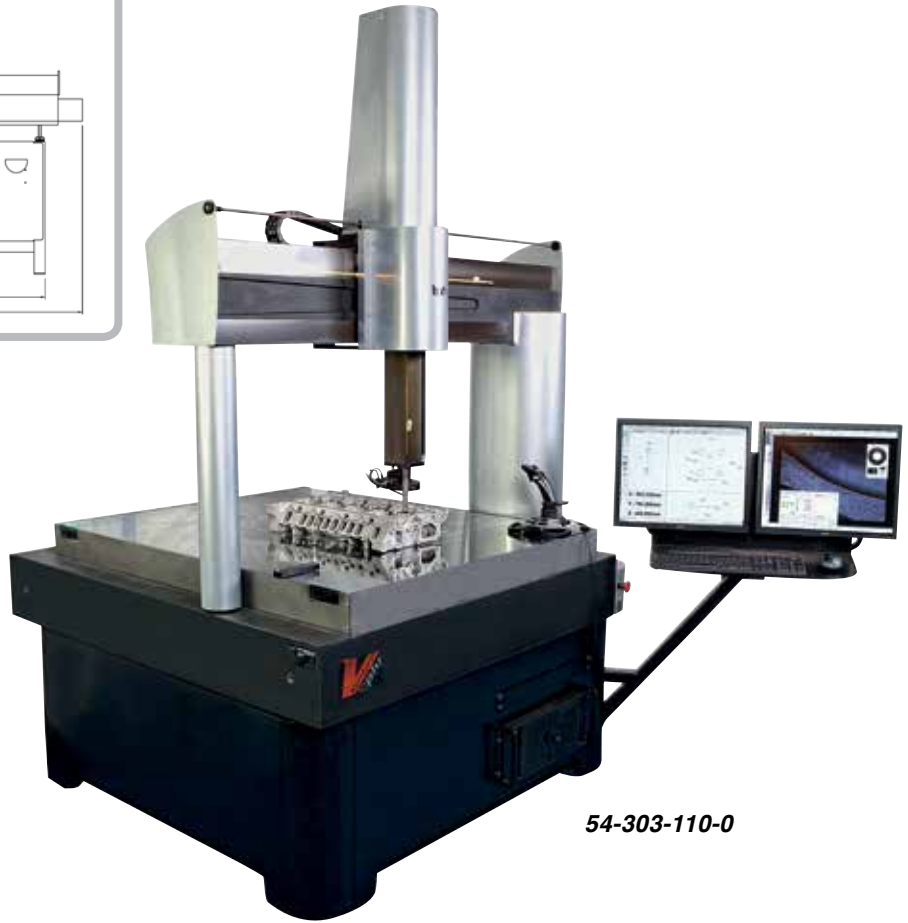
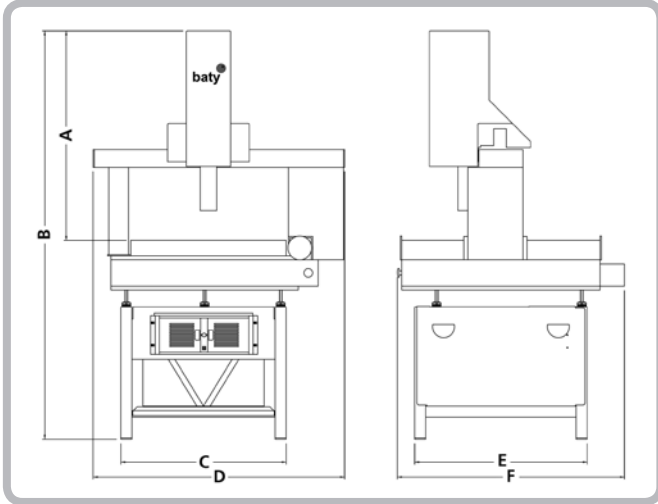
Programming using the touch probe is easy. Simply probe each element of the part using the minimum of points to create a program template. This process can be done at the machine using the actual part, or off-line using a CAD model. Measurements made using the camera are also automatically added to the current inspection program. Unique conditions are saved with each measurement so each element is measured in exactly the same way (lighting, edge detection settings etc.) for every part in a batch.

A probe changer rack can be installed so that multiple probe modules fitted with a variety of pre-calibrated styli can all 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.



Venture PLUS - VISION SYSTEM

Fowler Baty Vision Systems - Venture PLUS



54-303-110-0

Part Number	Dim. A	Dim. B	Dim. C	Dim. D	Dim. E	Dim. F
54-303-646-0	37.4"/950mm	72.8"/1851mm	29.5"/750mm	44.8"/1140mm	30.8"/783mm	40.5"/1030mm
54-303-649-0	33.4"/850mm	72.8"/1851mm	29.5"/750mm	44.8"/1140mm	42.6"/1083mm	52.3"/1330mm
54-303-110-0	56.7"/1440mm	88.5"/2250mm	54.3"/1380mm	57.8"/1470mm	53.1"/1350mm	57.8"/1470mm
54-303-150-0	56.7"/1440mm	88.5"/2250mm	54.3"/1380mm	57.8"/1470mm	72.8"/1850mm	77.5"/1970mm

VENTURE PLUS

Part Number	Description
54-303-646-0	Venture Plus - 25.2"/640mm x 11.2"/600mm x 9.8"/250mm
54-303-649-0	Venture Plus - 25.2"/640mm x 35.4"/900mm x 9.8"/250mm
54-303-110-0	Venture Plus - 39.4"/1000mm x 39.4"/1000mm x 15.7"/400mm
54-303-150-0	Venture Plus - 39.4"/1000mm x 59"/1500mm x 15.7"/400mm

VISION SYSTEM - Software



FUSION metrology software has been the foundation for Baty's camera based inspection systems for the last two decades. 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

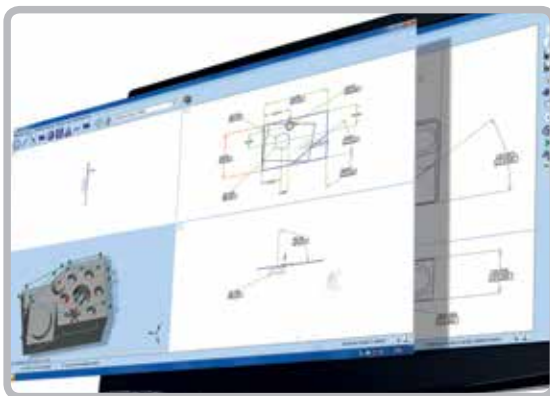
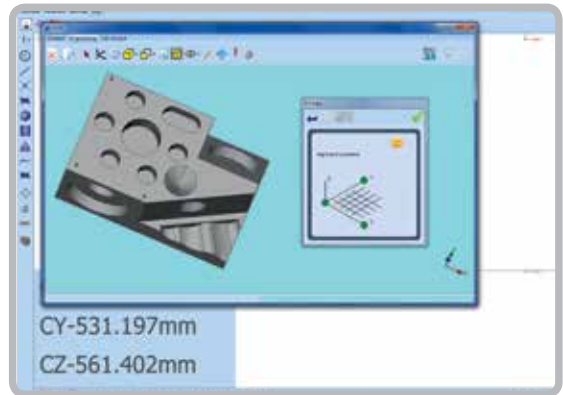
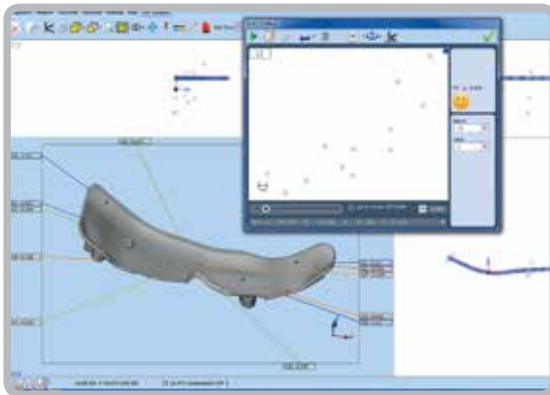
Measured results are displayed in the form of a fully dimensioned drawing. Dimensions within the specified tolerance are shown in green whilst dimensions out of tolerance are shown in red for immediate visual status of the measured part. Geometric tolerances can also be displayed using the standard drawing 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.	00774-0		Order No.			Date	20-04-04 10:00		
Title	Element Code	Serial No.	Inspector	Date					
Customer	01010	Material	Batch						
Feature	Dimension	Unit	Min	Max	Mean	Upper	Lower	Pass/Fail	Color
1. P100	Ø7.000	mm	Ø6.999	Ø7.001	7.000	7.000	7.000	Pass	Green
2.000	0.000	mm	0.000	0.000	0.000	0.000	0.000	Pass	Green
3.000	0.000	mm	0.000	0.000	0.000	0.000	0.000	Pass	Green
4.000	0.000	mm	0.000	0.000	0.000	0.000	0.000	Pass	Green
5.000	0.000	mm	0.000	0.000	0.000	0.000	0.000	Pass	Green
6.000	0.000	mm	0.000	0.000	0.000	0.000	0.000	Pass	Green
7.000	0.000	mm	0.000	0.000	0.000	0.000	0.000	Pass	Green
8.000	0.000	mm	0.000	0.000	0.000	0.000	0.000	Pass	Green
9.000	0.000	mm	0.000	0.000	0.000	0.000	0.000	Pass	Green
10.000	0.000	mm	0.000	0.000	0.000	0.000	0.000	Pass	Green
11.000	0.000	mm	0.000	0.000	0.000	0.000	0.000	Pass	Green
12.000	0.000	mm	0.000	0.000	0.000	0.000	0.000	Pass	Green
13.000	0.000	mm	0.000	0.000	0.000	0.000	0.000	Pass	Green
14.000	0.000	mm	0.000	0.000	0.000	0.000	0.000	Pass	Green
15.000	0.000	mm	0.000	0.000	0.000	0.000	0.000	Pass	Green
16.000	0.000	mm	0.000	0.000	0.000	0.000	0.000	Pass	Green
17.000	0.000	mm	0.000	0.000	0.000	0.000	0.000	Pass	Green
18.000	0.000	mm	0.000	0.000	0.000	0.000	0.000	Pass	Green
19.000	0.000	mm	0.000	0.000	0.000	0.000	0.000	Pass	Green
20.000	0.000	mm	0.000	0.000	0.000	0.000	0.000	Pass	Green
21.000	0.000	mm	0.000	0.000	0.000	0.000	0.000	Pass	Green
22.000	0.000	mm	0.000	0.000	0.000	0.000	0.000	Pass	Green
23.000	0.000	mm	0.000	0.000	0.000	0.000	0.000	Pass	Green
24.000	0.000	mm	0.000	0.000	0.000	0.000	0.000	Pass	Green
25.000	0.000	mm	0.000	0.000	0.000	0.000	0.000	Pass	Green
26.000	0.000	mm	0.000	0.000	0.000	0.000	0.000	Pass	Green
27.000	0.000	mm	0.000	0.000	0.000	0.000	0.000	Pass	Green
28.000	0.000	mm	0.000	0.000	0.000	0.000	0.000	Pass	Green
29.000	0.000	mm	0.000	0.000	0.000	0.000	0.000	Pass	Green
30.000	0.000	mm	0.000	0.000	0.000	0.000	0.000	Pass	Green

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.

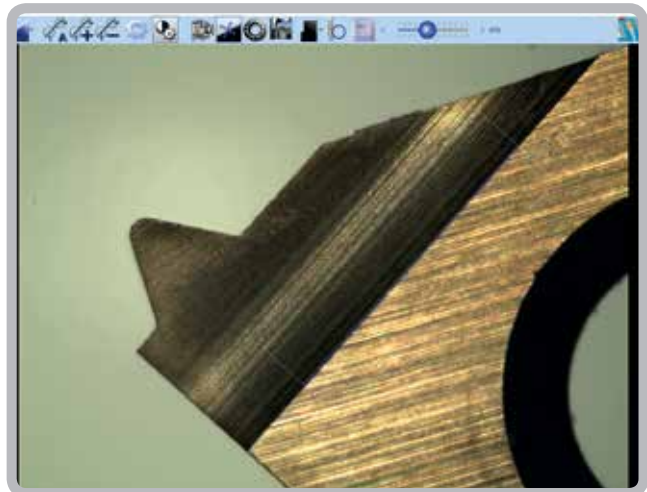
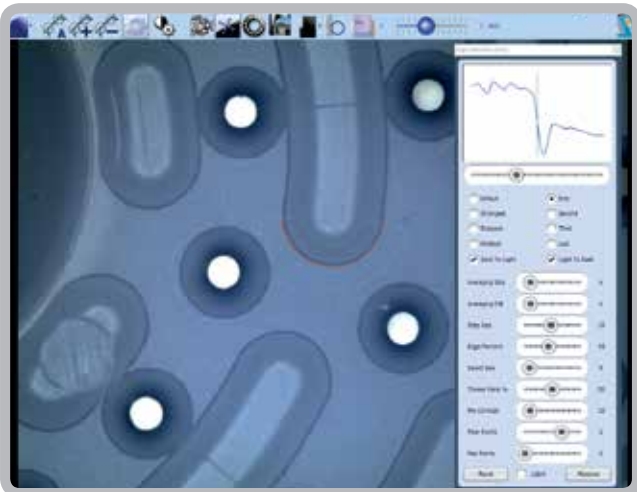
Image Stitching and Profile Scanning

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 features to be measured using the 'one click feature' or 'all features in area' tools.

Touch Probe Compatible

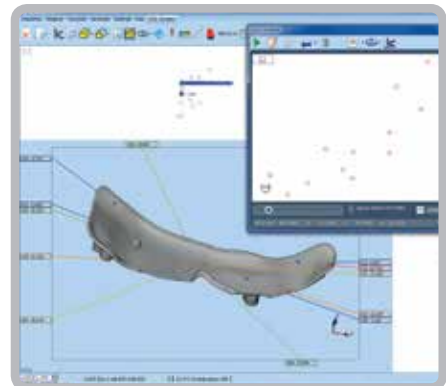
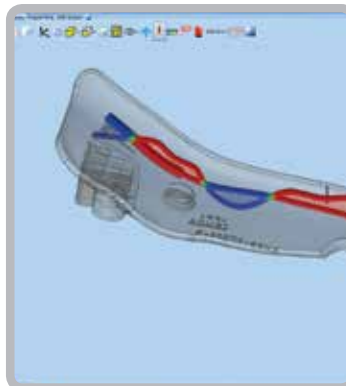
Fusion metrology software is ready to accept touch probe measurements as well as camera based. Offsets for each measuring system can be calculated enabling the combination of non-contact measurements in the same inspection. An optional probe storage rack can also be used to allow automatic probe changes mid program. For touch probe scanning applications, Renishaw's SP25 scanning probe option can be specified.

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.



VISION SYSTEM - Technical Specs.

Manual Systems

Manual Systems Technical Specifications

	54-403-001-0 VuMaster	54-251-150-0 Venture	54-303-250-0 Venture XT
X Y Z measuring range (mm)	400 x 300	250 x 125 x 160	300 x 300 x 200
Workstage area (mm)	420 x 320	414 x 262	464 x 462
Max workpiece load (lb/kg)	55/25	55/25	55/25
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 (L= measured length in mm)	7.5µm	(2+L / 100)µm	(2+L / 100)µm
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	No	No
Probe type	N/A	N/A	N/A
Change rack compatible?	N/A	N/A	N/A

*using optional 0.5x adapter lens

Technical Specs. - VISION SYSTEM

CNC Systems

CNC Systems Technical Specifications

	54-403-005-0 VuMaster	54-251-200-0 Venture	54-303-300-0 Venture XT	54-303-646-0 Venture Plus	54-303-649-0 Venture Plus
X Y Z measuring range (mm)	400 x 300	250 x 125 x 155	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 (lb/kg)	55/25	55/25	55/25	165/75	165/75
Drive type	CNC / handwheel	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 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
Resolution	0.001mm	0.0005mm	0.0005mm	0.0005mm	0.0005mm
Accuracy (L= measured length in mm)	7.5µm	2+L / 100	(2+L / 100)µm	(2.4 + 0.4 L /100)µm	(2.4 + 0.4 L /100)µm
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	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
Change rack compatible?	N/A	Yes	Yes	Yes	Yes

*using optional 0.5x adapter lens

OPTICAL COMPARATOR - RETROFIT

RETROFIT!

With our retrofit program you can dramatically enhance the functionality of your current optical comparator.

Advanced error mapping - increase accuracy of you comparator.
Comprehensive reporting including dimensioned drawing, SPC and EXCEL™ compatible first article inspection reports.

Compatible comparator types:

- Fowler-Baty/Gagemaster
- Starrett
- Scherr-Tumico
- Dorsey Gage
- Deltronic
- Nikon
- Mitutoyo
- Tesa
- Messtechnik ... *and much more!*



Upgrades Include:

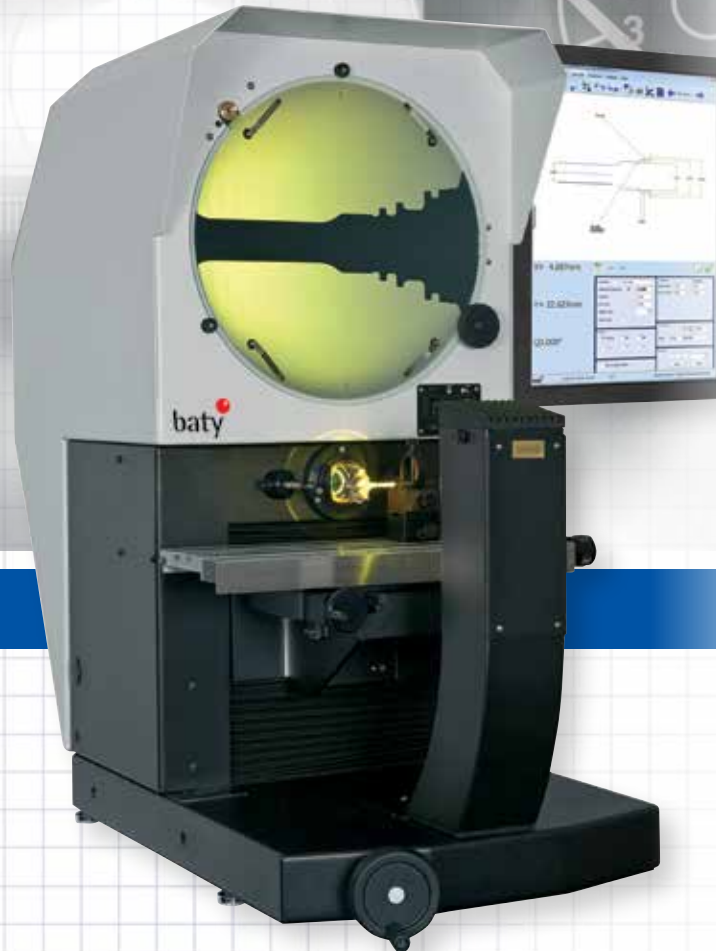
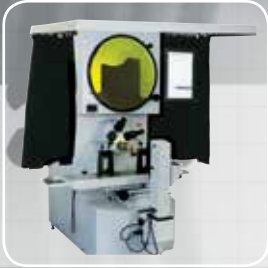
- 22" touch screen
- Intel NUC mini PC - Windows 10 OS
- Fusion FT2-E metrology software
- Optical edge sensor - *remove operator influence*
- Fast data point acquisition
- Entire system is plug and play
- Best fitting of profile data to imported DXF files - *No Overlays!*



HIGH PRECISION

baty

OPTICAL INSTRUMENTS OPTICAL COMPARATORS



OPTICAL COMPARATOR - R14

Fowler Baty Optical Comparator - R14

The Fowler Baty R14 bench mount optical comparator with its 340mm screen combines high accuracy non-contact measurement and inspection with a large 175mm x 100mm measuring range.

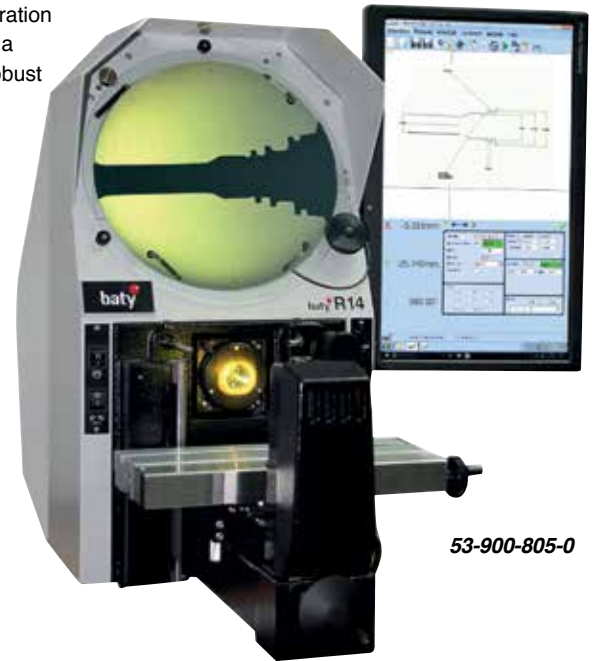
Choice of digital readouts and optional automatic profile edge detection ensures that you can have the comparator that fits your requirements. The horizontal light path configuration is ideally suited to turned machined parts that can be secured to the workstage using a range of optional accessories from the Fowler Baty fixture family. The compact and robust lightweight chassis makes the R14 ideal for workshop environments.

Features

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

Available Options

- Internally fitted automatic edge sensor
- Swing over lamphouse to allow clear access to the workstage
- Various display units are available to suit individual requirements
- Cabinet stand ensures a solid base and provides storage



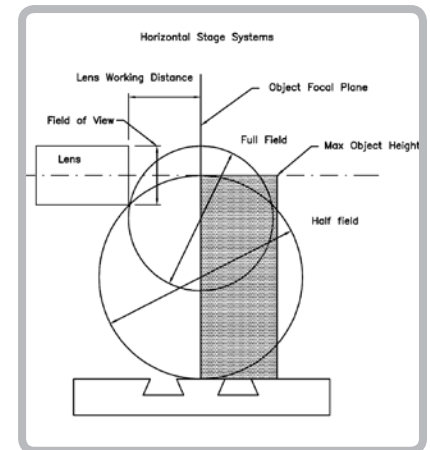
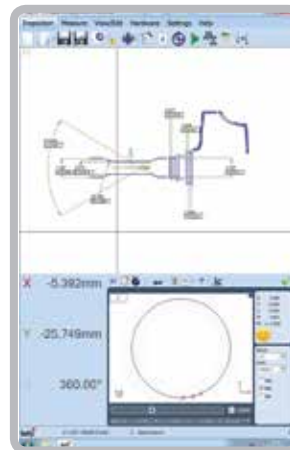
53-900-805-0

Projector Type	R14				
Magnification	10x	20x	25x	50x	100x
Field of view	35	18	14	7	4
Working Distance	82	38	24	15	31
Maximum	half field	103	103	80	45
Working Diameter	full field	120	109	56	31
				77	

LENS SYSTEMS

Part Number	Description
53-900-860-0	Lens system - magnification 10x
53-900-861-0	Lens system - magnification 20x
53-900-862-0	Lens system - magnification 25x
53-900-863-0	Lens system - magnification 50x
53-900-864-0	Lens system - magnification 100x

**Must be ordered separately*



R14

Part Number	Description	Functions
53-900-800-5	R14 - XLS Horizontal Optical Comparator w/Acu-rite DC 102 Readout - 14" screen	Basic XY or RA measurement ABS/INC mode, inch/metric conversion
53-900-800-1	R14 - GXL Horizontal Optical Comparator w/Heidenhain touch screen readout - 14" screen	Same functions as the 53-900-800-5 with added geometric functions and tolerancing
53-900-801-1	R14 - GXL - E Horizontal Optical Comparator w/DRO as GXL with added optical edge sensor - 14" screen	Same functions as 53-900-800-1 with added optical edge sensor
53-900-805-0	R14 - FT2 Horizontal Optical Comparator w/22" Fusion touch screen DRO and 14" screen	Windows based measuring with full reporting options, SPC, CAD import/export
53-900-810-0	R14 - FT2 - E Horizontal Optical Comparator w/27" Fusion touch screen DRO, optical edge sensor and 14" screen	Same as 53-900-805-0 with optical edge sensor included

R400 - OPTICAL COMPARATOR

Fowler Baty Optical Comparator - R400

The Fowler Baty R400 bench mount optical comparator with its 400mm screen combines high accuracy non-contact measurement and inspection with a large 300mm x 150mm measuring range.

Choice of digital readouts and optional automatic profile edge detection ensures that you can have the projector that fits your requirements. The horizontal light path configuration is ideally suited to turned machined parts that can be secured to the workstage using a range of optional accessories from the Fowler Baty fixture family. The robust design of the R400 makes it suitable for both the shop floor and the standards room.

Features

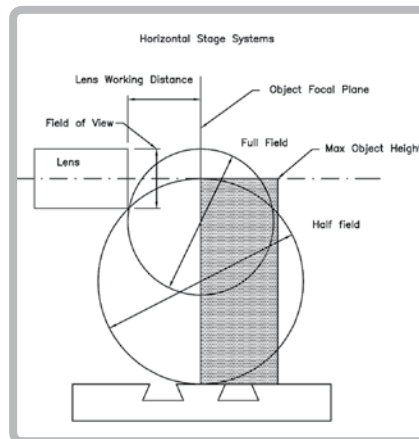
- 16"/400mm screen with 90° crosslines and chart clips
- Profile illumination with halogen lamp and green filter
- Lens magnification choice: 10x, 20x, 25x, 50x and 100x
- Surface illumination (fibre optic)
- Helix adjustment of light source for accurate thread form projection
- Workstage with two machined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

Available Options

- Internally fitted automatic edge sensor (FT2-E model only)
- Swing over lamphouse to allow clear access to the workstage
- Various display units to suit individual requirements
- Cabinet stand ensures a solid base and provides storage
- Other options include foot switch control



53-900-920-0



Projector Type	R400				
Magnification	10x	20x	25x	50x	100x
Field of view	40	20	16	8	4
Working Distance	80	82	70	53	43
Maximum	184	185	185	185	143
Working Diameter	179	176	181	147	122

all dimensions in mm

LENS SYSTEMS

Part Number	Description
53-900-987-0	Lens system - magnification 10x
53-900-988-0	Lens system - magnification 20x
53-900-989-0	Lens system - magnification 25x
53-900-990-0	Lens system - magnification 50x
53-900-991-0	Lens system - magnification 100x

**Must be ordered separately*

R400

Part Number	Description	Functions
53-900-905-0	R400 - XLS Horizontal Optical Comparator w/Acu-rite DC 102 Readout - 16" screen	Basic XY or RA measurement ABS/INC mode, inch/metric conversion
53-900-910-1	R400 - GXL Horizontal Optical Comparator w/Heidenhain touch screen readout - 16" screen	Same functions as the 53-900-905-0 with added geometric functions and tolerancing
53-900-915-1	R400 - GXL - E Horizontal Optical Comparator w/DRO as GXL with added optical edge sensor - 16" screen	Same functions as 53-900-910-1 with added optical edge sensor
53-900-920-0	R400 - FT2 Horizontal Optical Comparator w/22" Fusion touch screen DRO and 16" screen	Windows based measuring with full reporting options, SPC, CAD import/export
53-900-900-0	R400 - FT2 - E Horizontal Optical Comparator w/27" Fusion touch screen DRO, optical edge sensor and 16" screen	Same as 53-900-920-0 with optical edge sensor included

OPTICAL COMPARATOR - R600

Fowler Baty Optical Comparator - R600

The Fowler Baty R600 with its 24"/600mm screen and high specification presents the capability to make simple comparative non-contact measurement through to complex programmed measuring sequences with SPC capability and automatic edge detection.

The horizontal light beam configuration is ideally suited to large machined or turned workpieces for mounting in vee blocks and centres.

Features

- 24"/600mm screen with 90° cross lines and chart clips
- Heavy duty workstage with 18"/450mm x 8"/200mm measuring range and 2 machine slots for workpiece holders
- Angular rotation of $\pm 15^\circ$ on workstage for measuring thread forms or cutting tools
- Vertical 8"/200mm 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
- Surface illumination (fibre optic)
- Digital angle measurement
- 0.5 micron resolution

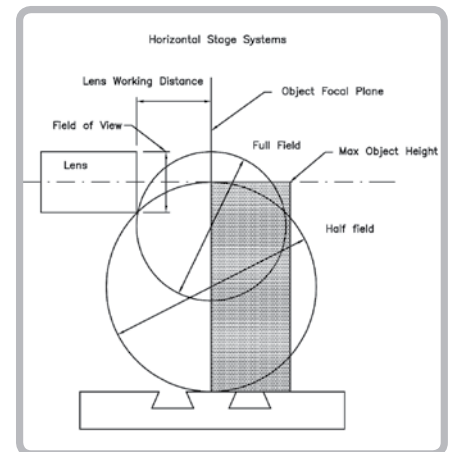
Available Options

- Horizontal axis motorisation via joystick control
- Internally fitted automatic edge sensor to allow the use of overlay charts on an unobstructed screen
- Various display units are available to suit individual requirements
- SPC to add to your quality control without the purchase of a separate system (FT2 / FT2-E only)
- 5x lens system as a single lens mount only



Projector Type	R600					
Magnification	5x	10x	20x	25x	50x	100x
Field of view	120 (4.72)	60 (2.36)	30 (1.18)	24 (.94)	12 (.47)	6 (1.72)
Working Distance	245 (9.64)	135 (5.31)	132 (5.19)	106 (4.17)	93 (3.15)	50 (1.96)
Maximum	292 (9.64)	343 (13.50)	343 (13.50)	343 (13.50)	343 (13.50)	195 (7.75)
Working Diameter	406 (18.98)	343 (13.50)	343 (13.50)	343 (13.50)	343 (13.50)	235 (9.25)

all dimensions in mm / (inches)



LENS SYSTEMS

Part Number	Description
53-900-185-1	Lens system - magnification 10x
53-900-185-2	Lens system - magnification 20x
53-900-185-3	Lens system - magnification 25x
53-900-185-4	Lens system - magnification 50x
53-900-185-5	Lens system - magnification 100x

**Must be ordered separately*

R600

Part Number	Description	Functions
53-900-960-5	R600 - XLS Horizontal Optical Comparator w/Acu-rite DC 102 Readout - 14" screen	Basic XY or RA measurement ABS/INC mode, inch/metric conversion
53-900-960-0	R600 - GXL Horizontal Optical Comparator w/Heidenhain touch screen readout - 14" screen	Same functions as the 53-900-960-5 with added geometric functions and tolerancing
53-900-965-1	R600 - GXL - E Horizontal Optical Comparator w/DRO as GXL with added optical edge sensor - 14" screen	Same functions as 53-900-960-0 with added optical edge sensor
53-900-955-0	R600 - FT2 Horizontal Optical Comparator w/22" Fusion touch screen DRO and 14" screen	Windows based measuring with full reporting options, SPC, CAD import/export
53-900-950-0	R600 - FT2 - E Horizontal Optical Comparator w/27" Fusion touch screen DRO, optical edge sensor and 14" screen	Same as 53-900-955-0 with optical edge sensor included

SM300 - OPTICAL COMPARATOR

Fowler Baty Optical Comparator - SM300

12"/300mm screen vertical light path comparator with multi-function readout unit and printer.

Robust design with full geometric measuring functionality ideal for the shop floor.

Features

- Top quality profile projector highly versatile and easy to operate
- Large travel range 150mm x 50mm (6"x 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

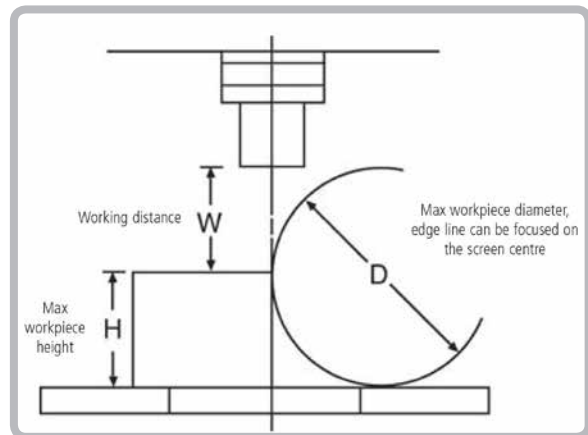
Available Options

- Projection lens 10x with half reflecting mirror
- Projection lens 20x with half reflecting mirror
- Projection lens 50x with half reflecting mirror
- Projection lens 100x with half reflecting mirror
- Rotary table 360°
- Swivel centre support
- Holder with clamp
- V-block with clamp



53-900-300-0

Magnification	Projection capacity (unit mm)			
	10x	20x	50x	100x
View field diameter	30	15	6	3
Working distance W	77.7	44.3	24.5	25.3
Max workpiece height H	80	80	80	80
Max workpiece diameter, edge line can be focused on screen centre D	160	130	55	60



LENS SYSTEMS

Part Number	Description
53-900-300-1	Lens system - magnification 10x
53-900-300-2	Lens system - magnification 20x
53-900-300-3	Lens system - magnification 50x
53-900-300-4	Lens system - magnification 100x

**Must be ordered separately*

SM300

Part Number	Description
53-900-300-0	SM300 - GMR Vertical Optical Comparator w/geometric readout

OPTICAL COMPARATOR - SM350

Fowler Baty Optical Comparator - SM350

This vertical 14"/350mm bench optical comparator features a large, heavy duty high precision workstage with 250mm x 125mm measuring range and 0.5 micron resolution. Another feature is the option of a three lens turret for instant lens changes without re-calibration.

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

Available Options

- Automatic screen-mounted edge sensing (FT2-E model only)
- Heavy duty cabinet stand
- 3-position rotating lens turret



53-900-354-0

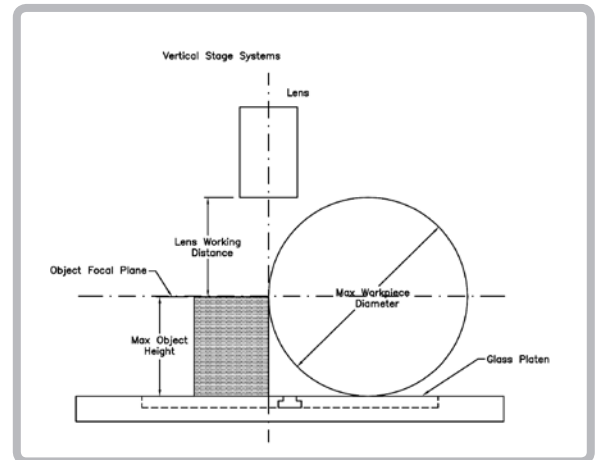
Projector Type	SM350				
Magnification	10x	20x	25x	50x	100x
Field of view	35	17	14	7	3
Working Distance	84	37	29	17	41
Maximum half field	220	162	52	51	140
Working Diameter full field	171	130	75	37	97
Maximum Height Object	114	113	106	111	103

all dimensions in mm

LENS SYSTEMS

Part Number	Description
53-900-860-0	Lens system - magnification 10x
53-900-861-0	Lens system - magnification 20x
53-900-862-0	Lens system - magnification 25x
53-900-863-0	Lens system - magnification 50x
53-900-864-0	Lens system - magnification 100x

**Must be ordered separately*



SM350

Part Number	Description	Functions
53-900-350-0	SM350 - XLS Vertical Optical Comparator w/Acu-rite DC 102 Readout - 14" screen	Basic XY or RA measurement ABS/INC mode, inch/metric conversion
53-900-351-0	SM350 - GXL Vertical Optical Comparator w/Heidenhain touch screen readout - 14" screen	Same functions as the 53-900-350-0 with added geometric functions and tolerancing
53-900-352-0	SM350 - GXL - E Vertical Optical Comparator w/DRO as GXL with added optical edge sensor - 14" screen	Same functions as 53-900-351-0 with added optical edge sensor
53-900-353-0	SM350 - FT2 Vertical Optical Comparator w/22" Fusion touch screen DRO and 14" screen	Windows based measuring with full reporting options, SPC, CAD import/export
53-900-354-0	SM350 - FT2 - E Vertical Optical Comparator w/27" Fusion touch screen DRO, optical edge sensor and 14" screen	Same as 53-900-353-0 with optical edge sensor included

SM20- OPTICAL COMPARATOR

Fowler Baty Optical Comparator - SM20

The Fowler Baty SM20 is a vertical light path floor standing optical comparator with a 20"/500mm which features a large heavy duty high precision workstage with 250mm x 125mm measuring range and a 0.5 micron resolution.

Features

- 20"/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 10" (250mm) x 5"(125mm)
- Digital angle measurement
- 0.5 micron resolution

Available Options

- Screen hood and curtains with generous proportions for use in bright ambient light conditions
- Automatic edge sensor
- 3 position lens turret for easy lens changing
- SPC to add to your quality control without the purchase of a separate system (FT2 and FT2-E only)

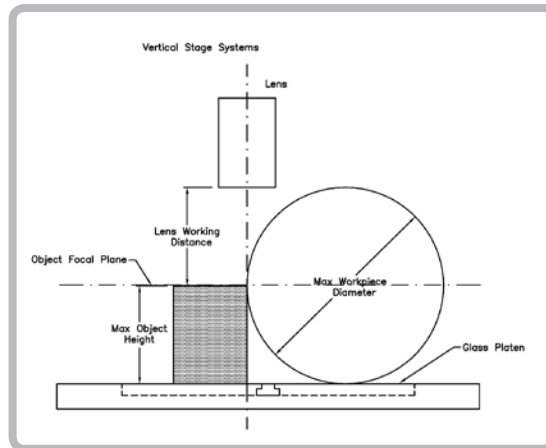


Projector Type	SM20					
Magnification	10x	20x	25x	25x	50x	100x
Condenser	L	L	L	S	S	S
Field of view	50	25	20	20	10	5
Max diameter	200	200	200	200	180	85
Max focal pane height (profile lighting)	205	203	218	254	240	195
Max end mill height (surface lighting)	150	153	153	153	150	150

LENS SYSTEMS

Part Number	Description
53-900-185-1	Lens system - magnification 10x
53-900-185-2	Lens system - magnification 20x
53-900-185-3	Lens system - magnification 25x
53-900-185-4	Lens system - magnification 50x
53-900-185-5	Lens system - magnification 100x

**Must be ordered separately*



SM20

Part Number	Description	Functions
53-900-320-0	SM20 - XLS Vertical Optical Comparator w/Acu-rite DC 102 Readout - 20" screen	Basic XY or RA measurement ABS/INC mode, inch/metric conversion
53-900-320-1	SM20 - GXL Vertical Optical Comparator w/Heidenhain touch screen readout - 20" screen	Same functions as the 53-900-320-0 with added geometric functions and tolerancing
53-900-320-2	SM20 - GXL - E Vertical Optical Comparator w/DRO as GXL with added optical edge sensor - 20" screen	Same functions as 53-900-320-1 with added optical edge sensor
53-900-320-3	SM20 - FT2 Vertical Optical Comparator w/22" Fusion touch screen DRO and 20" screen	Windows based measuring with full reporting options, SPC, CAD import/export
53-900-320-4	SM20 - FT2 - E Vertical Optical Comparator w/27" Fusion touch screen DRO, optical edge sensor and 20" screen	Same as 53-900-320-3 with optical edge sensor included

OPTICAL COMPARATOR - Readout Options

Fowler Baty Readout Options

The readout options from Baty include a fully programmable unit with geometrical functions and a software module allowing direct connection to a PC. All units are fully compatible with our full range of profile projectors, allowing for upgrades as required.

XLS Readout

The new Acu-rite DRO-100 Series LCD display unit. A simple two axis digital readout for point to point X,Y or R,A measurements with absolute/incremental readings. Functions also include a zero reset, an instant inch/mm conversion and an instant radius/diameter conversion.

Part Number: 53-900-500-0



GXL Readout

- Graphical display of measured feature
- Radius, angle, line, point, skew
- Inch, metric, polar, cart
- Data output to PC/printer
- Store inspection routines to prompt operator
- Tolerancing
- Multi-language menu
- On-screen help

Part Number: 53-900-505-0

GXL-E Readout

- Same options as the GXL readout
- Optical edge sensor included

Part Number: 53-900-510-0



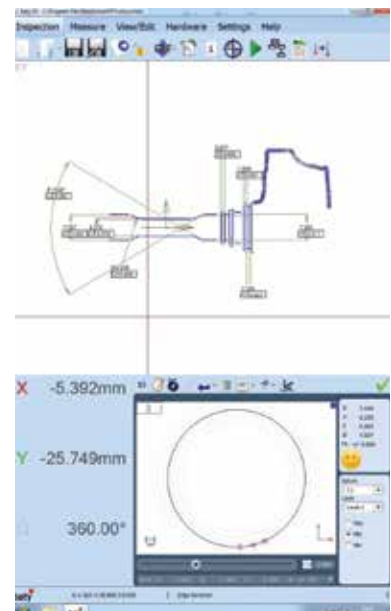
Fusion Touch Readout

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.

Part Number: 53-900-512-0

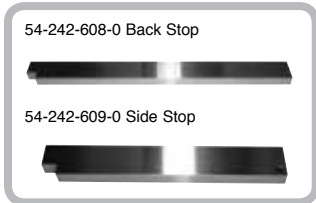
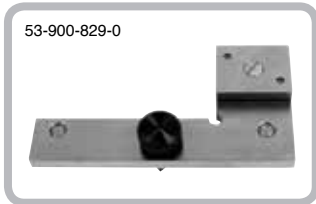
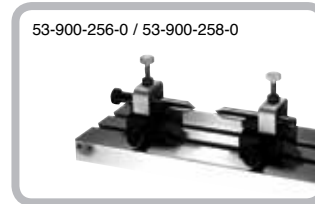
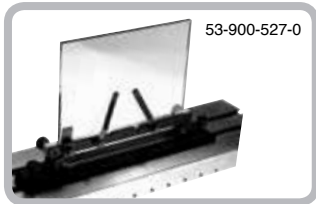
FT2-E: Complete TOUCH SCREEN DRO with 2D Fusion Touch software as above. Built-in optical edge detection allows data points to be taken 'on the fly' as the projected image is passed under the screen-mounted fibre optic sensor. An internally mounted edge sensor is available as an option on all 'R' series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

Part Number: 53-900-514-0



Accessories- OPTICAL COMPARATOR

Fowler Baty Options and Accessories



R14 / R400 Accessories

Part Number	Description
202-1327-1	Footswitch for GXL
ABFS001	Footswitch for FT2 DRO
52-371	Protective cover – R14
53-900-035-0	Protective cover - R400/SM350
53-900-828-0	Cabinet stand
53-900-250-0	Iris diaphragm
53-900-256-0	Vee blocks
53-900-258-0	Spring loaded centres
54-242-607-0	Riser blocks 38mm (1 1/2") for SA-256
53-900-825-0	Vice stage and vice
53-900-260-0	Swivel vice
53-900-276-0	Single vee and clamp (Vee parallel to optic axis)
53-900-153-0	Fixture base
53-900-527-0	Glass plate work holder

Fixture Family Accessories

Part Number	Description
53-900-822-0	Self centering vice
53-900-823-0	Dual axis vee block and clamp to Ø 15mm
53-900-824-0	Dual axis vee block and clamp to Ø 30mm
53-900-826-0	Precision rotary base
53-900-827-0	Universal base
53-900-829-0	Precision ground steel alignment feature
53-900-830-0	Dual axis vee block fitted with side base

R600 Accessories

Part Number	Description
53-900-551-0	Iris diaphragm for SM350/R600
53-900-542-0	Large vee blocks and centres
53-900-543-0	Riser blocks
SA-614	Large vice stage and vice
53-900-527-0	Glass plate work holder
SA-617	Heavy duty rotating vice
SA-733	Swing over lamphouse
53-900-606-0	Screen chart rest bar

SM350 / SM20 Accessories

Part Number	Description
54-242-606-0	Rotary glass stage
54-242-608-0	Back stop
54-242-609-0	Side stop
54-303-196-0	Dual vee block and centres
54-303-251-0	Open fram fixturing for 2510 stage
53-900-551-0	Iris diaphragm for SM350/R600
53-900-035-0	Protective cover - R400/SM350



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