Fowler®
HIGH PRECISION

TRIMOS

A-Line

Portable Measuring Arms

SWISS PRECISION

www.fowlerprecision.com

OVERVIEW

The Fowler Trimos A-line portable articulated measuring arms, assure an extremely easy and accurate 3D measurement. The A-line arms, certified according to ISO10360-2 standards, allow quality control, inspection, and verification of small and large size parts. Thanks to an extremely stable carbon structure, all models are light and easy to operate. You can choose between the A3, A5 and A6 models according to your specific application.

Features:
- Measuring ranges from 10"/250mm to 360"/9000mm
- Extremely easy to use
- Certified according to ISO 10360-2 standard
- Arms are configured with 6 or 7 axes
- Protected with an electromagnetic brake
- Laser scanning models available

A-LINE MODELS

A3
The A3 is the newest model of the Fowler Trimos A-line portable articulated measuring arms. Its particularity small size enables you to take it anywhere.

The 6-axis configuration arm is available in 51"/1300mm and 70"/1800mm measuring ranges. The carbon fiber tubes and aluminum mount base gives the A3 arm an extremely stable and light structure. With its mass counterbalance, an effortless handling experience is guaranteed.

A5 and A6
The A5 and A6 models represent the entry level of Trimos measuring arms. Reliability, accuracy and flexibility in use are their main characteristics.

The A5 and A6 arms exist in 6 or 7 axis configurations with 70"/1800mm to 354"/9000mm measuring ranges. They can also be used in combination with Laser Scanners for point cloud inspection or reverse-engineering. The A5 and A6 arms have magnetic brakes to prevent accidental fall of the arm and advanced electronics for better performance.

If you need to inspect a large, heavy part, don't move it, take the A5 - A6 arms to it and get your measurements done quickly with great flexibility.

These models have a measuring range of 9M with an incredible accuracy of 0.004"/0.1mm. This accuracy is attained due to our extensive experience in large volume metrology. The A5-A6 models are equipped with electromagnetic brakes on the second axis, which allows you to lock it at a required height and use the arm safely and comfortably.

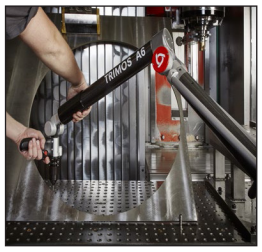
A-Line Portable Measuring Arms

Applications

Inspection

Automotive

Aerospace



Aviation

Accessories

Hard Probe - 54-960-230-0
The mechanical probe is the standard touch probe, available with different sphere diameters. Points can be taken by touching the part and pushing the button on board the probe body. The smallest usable probe diameter is 1mm to guarantee the point accuracy. The maximum suggested length is 100mm.

Floating Probe - 54-960-225-0
It is a rigid mechanical probe suspended on a spring and driven by an aluminum ring that triggers the probe with a simple touch. The integrated force control avoids uncontrolled load on the part, improving accuracy and repeatability. The control ring is isolated from the probe stylus to avoid thermal impact from the hands of the user.

Touch Trigger Probe - 54-960-240-0
The touch trigger probe acquires measuring points by applying the minimum force on the measured part. It is very precise, quick and comfortable to use, and acquires points by only touching the surface, without triggering buttons.

Fastening Bases - 54-960-260-0
Mobile tripods, stable and practical, are the ideal accessory to move all A-line arms easily and quickly. The tripod is adjustable in height (range 900-1400mm) and the weight of the tripod column is balanced by a gas spring. A side handle allows for vertical and horizontal movement. A removable and rotary shelf allows positioning of the laptop next to the measuring arm.

Magnetic Base - 54-960-261-0
The magnetic base allows the instrument to produce the highest precision with minimum installation effort.

Fowler® FUSION

Metrology Software

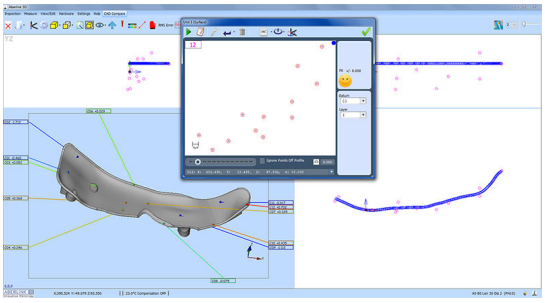
Fowler FUSION is the software used with our A-line arms. The philosophy for Fowler FUSION is to make measurement easy. Fowler FUSION 3D software has been written by engineers for engineers and sets the industry standard for simple-to-use software.

Designed around a graphical interface, Fowler FUSION 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.

Additional Fowler FUSION software module:

CAD Comparison

The CAD Comparison module gives the capability to compare measured points to a CAD model. This is the best way to measure complex geometries, or to inspect parts for which drawings do not exist.



Key Features

Feature Inspection:
- Automatic measurement routines
- Powerful interactive graphics window
- Automatic feature recognition
- 2D and 3D inspection
- Geometric feature inspection
- Free form curve inspection

Programming Tools:
- Teach & repeat programming
- Drag and drop program editor
- Run programs from any point
- Measure a subset of features
- Simple object-based programming
- No complex programming language

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

Order Number	Software	
54-960-070-0	Fowler FUSION 3D Software	Standard
54-960-071-0	Fowler FUSION CAD Compare	Optional
54-960-072-0	Fowler FUSION CAD Programming	Optional
54-960-073-0	Fowler FUSION Offline Seat	Optional

LASER SCANNER

For complex-profile contour scanning, various Laser Scanners can be combined with our 7 axes arms.

Fowler is pleased to offer the PreciTrack 3D Laser Scanner for seamless non-contact inspections

Please contact our Technical Team for software options
1-800-788-2353

PreciTrack 3D

Speed	Hz, Pts/Sec	300 Hz, 348 000 Pts/Sec
Resolution X-Axis	Points/Line	12800
Line Width	in(mm)	1"(25) / 2"(50) / 4"(100)
Working Distance	in(mm)	2.1"(53) / 2.75"(70) / 6.7"(170)
Working Range	in(mm)	1"(25) / 2"(50) / 4"(100)
Resolution	µm	19 / 39 / 78
Material Sensitivity		Light to Dark Shiny to Matte
Light Source		405 nm Blue 658 nm Red
Laser Class		2M (Default) 3R (Optional)
Multi Sensoric		YES
PC Interface		Ethernet
Scanner Interface		PRECI Link Kabel
RetroFit Kit		YES

A-Line Arm & ALP Laser Scanner Accuracy	Measuring Range	Tactile Volumetric Accuracy*	Laser Scanner Volumetric Accuracy**	Weight
A-Line Arm 1.8m - 7 Axis	70.9"/1800mm	0.0011"/0.027mm	0.0013"/0.032mm	21 lbs./9.7 kg
A-Line Arm 2.5m - 7 Axis	98.4"/2500mm	0.0013"/0.034mm	0.0016"/0.040mm	22 lbs./ 10.2 kg
A-Line Arm 3.2m - 7 Axis	126.0"/3200mm	0.0018"/0.045mm	0.0021"/0.053mm	23 lbs./10.6 kg
A-Line Arm 4.0m - 7 Axis	157.5"/4000mm	0.0022"/0.056mm	0.0026"/0.065mm	25 lbs./11.3 kg
A-Line Arm 5.0m - 7 Axis	196.9"/5000mm	0.0030"/0.075mm	0.0034"/0.087mm	31 lbs./13.9 kg
A-Line Arm 7.0m - 7 Axis	275.6"/7000mm	0.0035"/0.090mm	0.0041"/0.104mm	34 lbs./15.4 kg
A-Line Arm 9.0m - 7 Axis	354.3"/9000mm	0.0043"/0.110mm	0.0050"/0.127mm	39 lbs./17.9mm

Part Number	Description
54-960-101-0	PreciTrack 3D Blue Laser Scanner
54-960-101-1	PreciTrack 3D Red Laser Scanner
54-960-304-0*	Polyworks 3D Laser Scanner Software
54-960-310-0*	NX (UG) Translator Native CAD file translator for NX (UG), node-locked

Must be used with laser scanner

Specifications subject to change without notice.

AT - TUBE MEASUREMENT SYSTEM

The perfect equipment for pipe inspection with a laser fork and dedicated software.

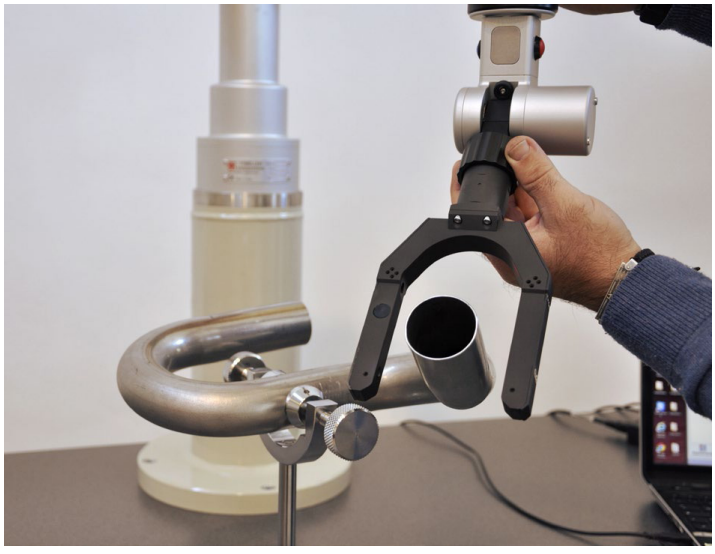
Based on the A5 and A6 arm design, it is a portable articulated arm CMM ideal for the quick and accurate inspection of pipes and other parts within its range.

The Fowler Trimos AT is a 6 axis arm available in several sizes, from 71"/1800mm to 197"/5000mm. The counter-balance system, with double springs provides an instrument with extremely light weight and easy handling. The AT portable arm unit can be placed on the top of the table with a support or just directly on a rigid laminate top surface. It may be also used with a mobile tripod.

Trimos AT

Axes	Measuring Range	Volumetric Accuracy with Laser Fork**	Touch Probe Point Accuracy*	Point Repeatability*	Weight
6	71"/1800mm	0.0022"/0.056mm	0.0010"/0.025mm	0.0008"/0.02mm	17.4lbs./7.9kg
6	98"/2500mm	0.0025"/0.063mm	0.0014"/0.036mm	0.0011"/0.028mm	18.5lbs./8.4kg
6	126"/3200mm	0.0028"/0.072mm	0.0018"/0.045mm	0.0014"/0.035mm	19.4lbs./8.8kg
6	157"/4000mm	0.0039"/0.099mm	0.0024"/0.06mm	0.0018"/0.045mm	20.9lbs./9.5kg
6	197"/5000mm	0.0048"/0.122mm	0.0035"/0.09mm	0.0024"/0.06mm	25.3lbs./11.5kg

** 2 sigma error*
*** with 50mm fork*

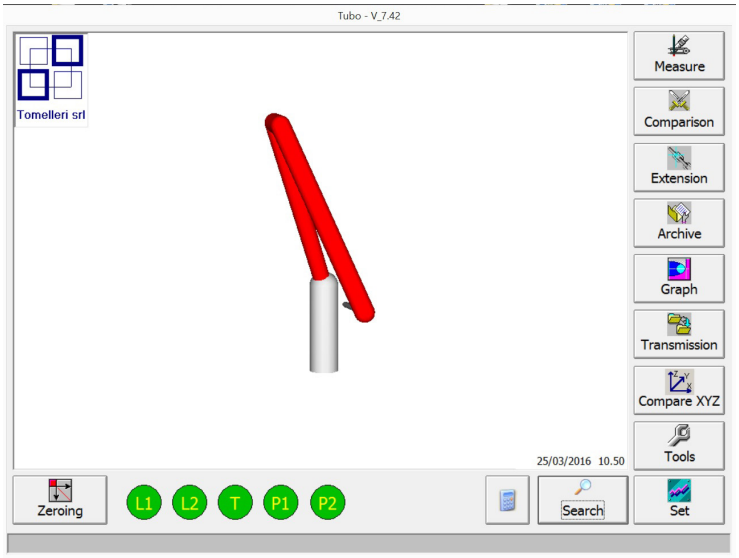


Pipe measurement with laser fork

Pipe measurement with touch probe

SOFTWARE TUBO

Software TUBO assures the performance of your pipe measurements:



- Straight tubes
- Bent tubes, measuring just the straight lengths
- Bends (survey the bending radius)
- Consecutive bends (absence of straight length between one bend and another bend, also called bend-in-bend)
- Scaled tube
- Secondary tubes welded to the main tube
- RCV (variable radius bend) tubes
- Tubes having non circular sections (profiles)
- Possibility to change tube diameter during the measuring procedure

Comparisons and correction

- Comparison and correction (classic mode) linked to the CNC
- Spring back correction (20 – 120)
- Alignment: possibility to obtain the data of the measured tube regarding (aligned) a master tube that is already in memory, to an external reference or to a drawing (manual and automatic procedure).
- Creation of material archive for the spring-back compensation to apply to the bending program.

LASER FORK

Ideal accessory for the rapid measurement without direct contact of the pipe.

5 forks size are available: 1.2"/30mm, 2"/50mm, 3.2"/80mm, 5.9"/150mm, 7.8"/200mm

The smaller forks feature a laser pointer to spot small pipes during the measurement. Pipes from 2mm to 180mm in diameter can be measured with the use of a laser fork, larger diameters can be measured with the touch probe.

TECHNICAL SPECIFICATIONS

Part Number	Axes	Measuring Range	Volumetric Accuracy	Point Repeatability	Weight
A3					
54-960-001-0	6	51"/1300mm	0.0006"/0.015mm	0.0003"/0.008mm	20lbs./9.5kg
54-960-002-0	6	70"/1800mm	0.0007"/0.018mm	0.0003"/0.008mm	23lbs./10.4kg
A5					
54-960-020-0	6	70"/1800mm	0.0007"/0.020mm	0.0004"/0.012mm	18lbs./8.4kg
54-960-021-0	6	98"/2500mm	0.0010"/0.026mm	0.0006"/0.016mm	19lbs./8.9kg
54-960-022-0	6	125"/3200mm	0.0014"/0.036mm	0.0008"/0.020mm	20lbs./9.3kg
54-960-023-0	6	157"/4000mm	0.0018"/0.046mm	0.0009"/0.024mm	23lbs./10kg
54-960-040-0	6	196"/5000mm	0.0025"/0.065mm	0.0015"/0.038mm	27lbs./12.5kg
54-960-041-0	6	275"/7000mm	0.0031"/0.080mm	0.0018"/0.048mm	31lbs./14kg
54-960-042-0	6	354"/9000mm	0.0039"/0.100mm	0.0023"/0.060mm	36lbs./16.5kg
A6					
54-960-030-0	7	70"/1800mm	0.0010"/0.027mm	0.0006"/0.017mm	19lbs./8.9kg
54-960-031-0	7	98"/2500mm	0.0013"/0.034mm	0.0008"/0.021mm	20lbs./9.4kg
54-960-032-0	7	125"/3200mm	0.0017"/0.045mm	0.0010"/0.026mm	21lbs./9.8kg
54-960-033-0	7	157"/4000mm	0.0022"/0.056mm	0.0011"/0.030mm	23lbs./10.5kg
54-960-050-0	7	196"/5000mm	0.0029"/0.075mm	0.0019"/0.050mm	30lbs./13.5kg
54-960-051-0	7	275"/7000mm	0.0035"/0.090mm	0.0023"/0.060mm	33lbs./15kg
54-960-052-0	7	354"/9000mm	0.0043"/0.110mm	0.0027"/0.070mm	38lbs./17.2kg

Accuracies

Part Number	Axes	E_{Bi} [1]	P_{size} [2]	P_{form} [3]	L_{dia} [4]
A5					
54-960-020-0	6	0.0009"/0.023mm	0.0003"/0.007mm	0.0006"/0.015mm	0.0010"/0.025mm
54-960-021-0	6	0.0012"/0.030mm	0.0004"/0.010mm	0.0007"/0.019mm	0.0013"/0.032mm
54-960-022-0	6	0.0017"/0.042mm	0.0006"/0.014mm	0.0010"/0.025mm	0.0018"/0.045mm
54-960-023-0	6	0.0022"/0.057mm	0.0007"/0.018mm	0.0013"/0.033mm	0.0024"/0.062mm
54-960-040-0	6	0.0031"/0.078mm	0.0009"/0.024mm	0.0017"/0.042mm	0.0033"/0.085mm
54-960-041-0	6	0.0047"/0.120mm	0.0014"/0.035mm	0.0023"/0.059mm	0.0049"/0.125mm
54-960-042-0	6	—	—	—	—
A6					
54-960-030-0	7	0.0012"/0.031mm	0.0003"/0.008mm	0.0008"/0.020mm	0.0013"/0.032mm
54-960-031-0	7	0.0016"/0.040mm	0.0005"/0.012mm	0.0010"/0.026mm	0.0017"/0.043mm
54-960-032-0	7	0.0020"/0.052mm	0.0006"/0.016mm	0.0013"/0.033mm	0.0023"/0.059mm
54-960-033-0	7	0.0027"/0.069mm	0.0012"/0.020mm	0.0017"/0.042mm	0.0031"/0.079mm
54-960-050-0	7	0.0036"/0.092mm	0.0010"/0.026mm	0.0021"/0.053mm	0.0043"/0.108mm
54-960-051-0	7	0.0053"/0.135mm	0.0015"/0.037mm	0.0029"/0.073mm	0.0059"/0.151mm
54-960-052-0	7	—	—	—	—

Part Number	Axes	MPE_p [5]	MPE_e [6]
A3			
54-960-001-0	6	0.0003"/0.008mm	0.005mm + L\50mm < 0.015mm
54-960-002-0	6	0.0003"/0.008mm	0.005mm + L\50mm < 0.018mm

1. Maximum permissible longitudinal error of measurement, bi-directional
2. Maximum permissible probe deviation, size
3. Maximum permissible probe deviation, shape
4. Maximum permissible probe deviation, position
5. Maximum permissible error, probing
6. Maximum permissible error, length measurement

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