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# A-Line

## Portable Measuring Arms



# 1.

## PRESENTATION

Trimos new A-line portable articulated measuring arms allow an extremely easy and accurate 3D measurement.

The A-line arms certified according to ISO10360-2 standard allow quality control, inspection, 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 A4, A5, A6, A7, A8, A9 and AT models according to your application.

- Measuring ranges from 250 mm to 9000 mm
- Portable measuring instrument
- Extremely easy to use
- Certified according to ISO 10360-2 standard
- Exist in 5, 6 or 7 axis configuration
- Protection with electromagnetic brake



# 2.

## MODELS

### A4, A5 and A6

The A4, A5 and A6 models represent the entry level of Trimos measuring arms. Reliability, accuracy and flexibility in use are their main characteristics.

The A4 arm is available in 6 axes configuration. This easy-to-use instrument includes all essential functions and is available in several sizes, from 1800 mm to 3200 mm measuring range.

The A5 and A6 arms exist in 6 or 7 axis configuration with 1800 mm to 4000 mm measuring range. They can also be used in combination with Laser Scanners for point cloud inspection or reverse-engineering. The A5 and A6 arms have magnetic brake to prevent accidental fall of the arm and improved electronics for better performance.

### A7 and A8

If you need to inspect a big and heavy part, don't move it, take the A7-A8 arms on it and get your measurements done quickly with great flexibility.

The A7 and A8 model have a measuring range of 9 m with an incredible accuracy of 0.1 mm! This is the result of a great experience in large volume metrology.

A7-A8 are equipped as standard with an electromagnetic brake on the second axis, which allows the operator to lock it at required height and use the arm safely and comfortably.

### A9

A9 is a new concept for portable articulated arm CMM, designed to get the best accuracy performance with the best part access thanks to its 5 axes. It is dedicated for precise part inspection, in quality control or any other process where a touch probe control is necessary.

A9 is light-weight and is easy to handle. A counter-balance makes the movement of the axes extremely smooth. It's the perfect equipment for touch probe inspection when ease of use and high precision is necessary quickly and within a hand's reach. The particular design of the arms allows access to the measurement of the workpiece around its outline, like no other CMMs can do!

# 3.

## TECHNICAL DATA

### Standard Arm

Models A4 ÷ A9		Axes	Measuring range (mm)	Volumetric accuracy (mm)	Point Repeatability (mm)	Weight (Kg)
<b>A4</b>	A4 - 1800	6	1800	0.025	0.018	7.9
	A4 - 2500	6	2500	0.036	0.022	8.4
	A4 - 3200	6	3200	0.045	0.032	8.8
<b>A5</b>	A5 - 1800	6	1800	0.020	0.012	8.4
	A5 - 2500	6	2500	0.026	0.016	8.9
	A5 - 3200	6	3200	0.036	0.020	9.3
	A5 - 4000	6	4000	0.046	0.024	10
<b>A6</b>	A6 - 1800	7	1800	0.027	0.017	8.9
	A6 - 2500	7	2500	0.034	0.021	9.4
	A6 - 3200	7	3200	0.045	0.026	9.8
	A6 - 4000	7	4000	0.056	0.030	10.5
<b>A7</b>	A7 - 5000	6	5000	0.065	0.038	12.5
	A7 - 7000	6	7000	0.080	0.048	14
	A7 - 9000	6	9000	0.100	0.060	16.5
<b>A8</b>	A8 - 5000	7	5000	0.075	0.050	13.5
	A8 - 7000	7	7000	0.090	0.060	15
	A8 - 9000	7	9000	0.110	0.070	17.5
<b>A9</b>	A9 - 250	5	250	0.004 + L/50	0.005	12
	A9 - 400	5	400	0.006 + L/40	0.007	14

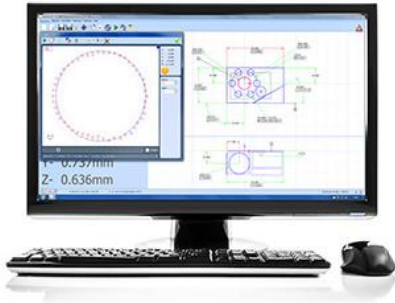
### Arm to measure Tubes (AT)

Model AT		Axes	Measuring range (mm)	Volumetric accuracy with Laser Fork ** (mm)	Touche probe point accuracy * (mm)	Point Repeatability* (mm)	Weight (Kg)
<b>AT</b>	AT - 1800	6	1800	0.056	0.025	0.020	7.9
	AT - 2500	6	2500	0.063	0.036	0.028	8.4
	AT - 3200	6	3200	0.072	0.045	0.035	8.8
	AT - 4000	6	4000	0.099	0.060	0.045	9.5
	AT - 5000	6	5000	0.122	0.090	0.060	11.5

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

# 4.

## SOFTWARE



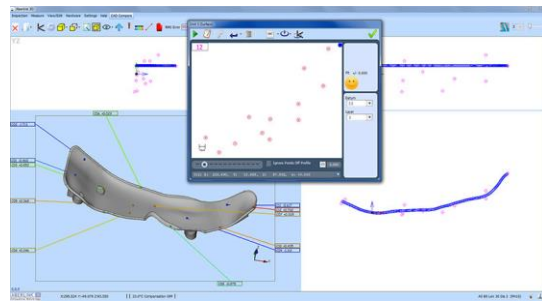
Aberlink 3D Measurement is the software used with our A-line arms. The philosophy for Aberlink is to make measurement easy. Aberlink 3D software has been written by engineers for engineers and sets the industry standard for simple-to-use software.

Designed around a graphical interface, Aberlink 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.

### Additional Aberlink 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

#### Supported Machines :

- Coordinate Measuring Machines
- Portable arms

#### Supported Probes :

- Manual probe heads
- Rigid probes
- Touch trigger probes

Software	
3D FOR MANUAL	Included
CAD COMP	Option
OFFLINE	Option

# 5.

## LASER SCANNER

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

Two types of Laser Scanners are available:

LDI, SLP and XLP

Capturing up to 225 000 points par second

NIKON, MMCX and MMDX

Capturing from 24 000 to 150 000 points par second

All Laser Scanners can be quickly applied to the rotating 7th axis of the arm.



A6 / A8 + LDI Scanner**	Measuring range (mm)	Volumetric accuracy with Laser Fork ** (mm)	Touche probe point accuracy * (mm)	Point Repeatability* (mm)	Poids (Kg)
A6-1800 – 7 axes	1800	0.027	0.055	0.020	9.7
A6-2500 – 7 axes	2500	0.034	0.062	0.025	10.2
A6-3200 – 7 axes	3200	0.045	0.073	0.030	10.6
A6-4000 – 7 axes	4000	0.056	0.084	0.035	11.3
A8-5000 – 7 axes	5000	0.075	0.100	0.045	13.9
A8-7000 – 7 axes	7000	0.090	0.115	0.060	15.4
A8-9000 – 7 axes	9000	0.110	0.135	0.075	17.9

\*= 2 sigma error \*\* with mod. SLP-500



Nikon MMC scanner



Scanner LDI SLP

# 6.

## TRIMOS AT – TUBE MEASUREMENT SYSTEM

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

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

The Trimos AT is a 6 axis arm available in several sizes, from 1800 mm to 5000 mm. The counter-balance system with a double spring gives the machine an 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 can be also used with a mobile tripod.



Trimos AT	Axes	Measuring range (mm)	Volumetric accuracy with Laser Fork** (mm)	Touche probe point accuracy* (mm)	Point Repeatability* (mm)	Weight (Kg)
AT – 1800	6	1800	0.056	0.025	0.020	7.9
AT – 2500	6	2500	0.063	0.036	0.028	8.4
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Pipe measurement by laser fork



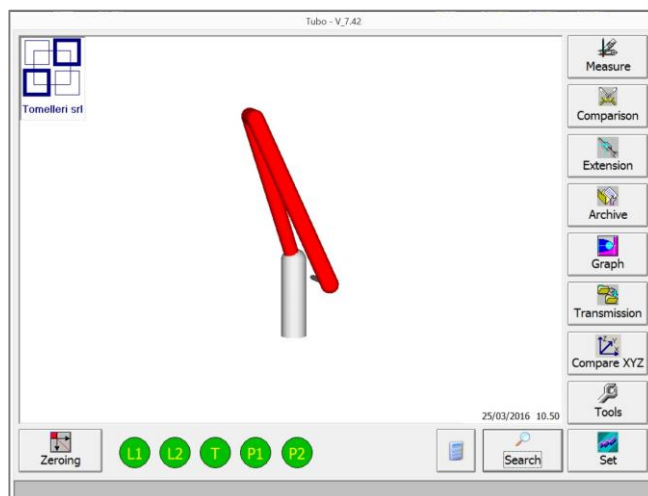
Pipe measurement by touch probe



## Software TUBO

Software TUBO assures the performance of your pipe measurements:

- of straight tubes
- of bent tubes measuring just the straight lengths
- of bends (survey the bending radius)
- of consecutive bends (absence of straight length between one bend and the other one, also called bend-in-bend)
- of scaled tube
- of secondary tubes welded to the main tube
- of RCV (variable radius bend) tubes
- of tubes having non circular section (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 with the pipe.

5 forks size are available (mm): 30, 50, 80, 150, 200

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



# 7.

## ACCESSORIES



### Hard Probe

The mechanical probe is the standard touch probe, available with different sphere diameter. Points can be taken 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 length suggested is 100mm.



### Floating Probe

It is a rigid mechanical probe suspended on a spring driven by an aluminum ring that triggers the probe with a simple touch. The integrated force control avoids to apply 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.

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### Touch Trigger Probe

The touch trigger probe acquire points applying the minimum force on the measured part. Is a very precise, quick and comfortable in use, acquires points only touching the surface, without triggering buttons.



### Fastening Bases

- Mobile Tripods  
Stable and practical, is the ideal accessory to move easily and quickly all A-line arms. The tripod is adjustable in height (range 900-1400mm)

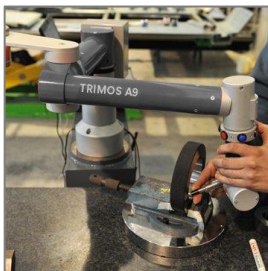
and the weight of the tripod column is balanced by a gas spring. A side handle allows for vertical and horizontal movement of the tripod. A removable and rotary shelf allows positioning of the laptop next to the measuring arm.



- Magnetic Base  
This magnetic base will allow your machine to produce the highest quality precision. Only a minimum effort will need to install it with your machine.

# 8.

## APPLICATIONS



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