

TRIMOS 3D

Trimos' new business unit, the **TRIMOS 3D** focuses on products that measure in 3D and are used in the workshop.

It is represented by two product lines, the **A-Line** Measuring arms and the **C-Line** Portable CNC CMM.

A-Line

Measuring arms



C-Line

Portable CNC CMM



C-Line 3D

Portable Coordinate Measuring Machine (CMM)
designed for the Workshop



1.

PRESENTATION

Trimos new C-Line is the world's first truly portable Coordinate Measuring Machine designed for the workshop. This product line is part of the new **TRIMOS 3D** product group.

- Portable for the maximum of flexibility (works on batteries)
- Ethernet or wireless communication (WiFi / Bluetooth)
- Small footprint, for a large volume of work
- Designed for workshop operation
- High precision, thanks to the Renishaw TP20 probe
- Ease of use thanks to Aberlink software
- Fully CNC combined with manual operation
- Offline programming by importing a CAD model
- Logical 3D complement to the height gage 1D/2D

Portable

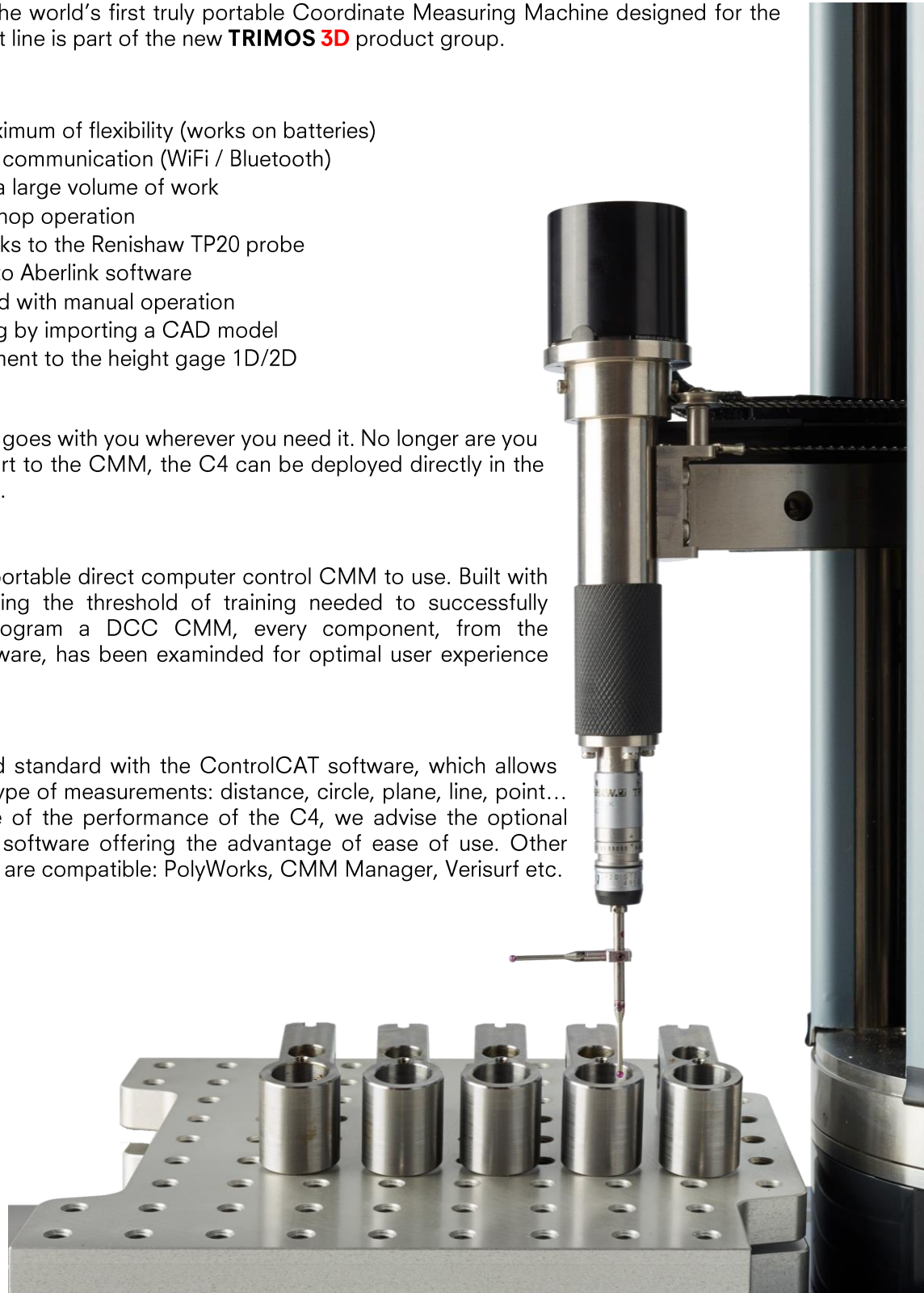
At only 13,5 kg, the C4 goes with you wherever you need it. No longer are you required to take the part to the CMM, the C4 can be deployed directly in the manufacturing process.

Easy-to-Use

The C4 is the easiest portable direct computer control 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.

Software

The C-Line is delivered standard with the ControlCAT software, which allows you to perform many type of measurements: distance, circle, plane, line, point... To take full advantage of the performance of the C4, we advise the optional Aberlink software, 3D software offering the advantage of ease of use. Other measurement software are compatible: PolyWorks, CMM Manager, Verisurf etc.



In North America the C-Line is commercialized under the Z Cat model name.

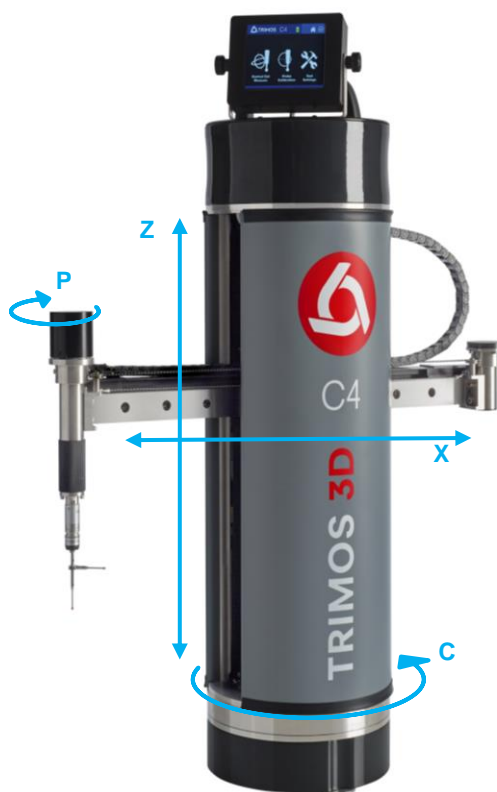


2.

MODELS

The C4 has 4 axes motorized (X, C, Z, P), it allows high performance measurements in 3D

Its special probing module, equipped with a vertical and horizontal stylus, considerably increases the possibilities of measurement, notably reducing the repositioning of the measurand.



3.

FLEXIBILITY AND PORTABILITY

The C4 is equipped by default with a lithium-ion battery system, which gives it an autonomy of about 4 hours under normal conditions of use.

Moreover, in addition to a wired Ethernet connection, the C4 can be equipped with a Bluetooth or Wifi wireless device and thus offer a complete autonomy.

Its lighter weight of 13.5 kg and ergonomic handle allow the C4 to increase the autonomy, making it unequalled on its market.



4.

COMPONENTS AND ACCESSORIES

Standard delivery

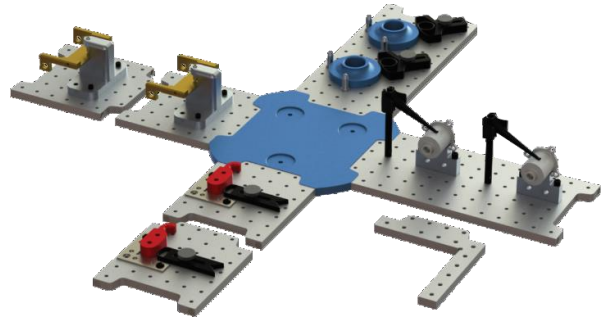
- C-Line CMM
- Probe module type TP20 (M2) special C-Line, with vertical and horizontal probes $\varnothing 2$ [mm]
- Test piece with calibration sphere
- Charger with power supply
- Protective cover
- Shipping box and inserts
- Trimos Calibration Certificate



Test piece with calibration sphere

Accessoires

- Ethernet, Bluetooth or Wifi adapter
- Probe module type TP20 (M2) special C-Line, with vertical and horizontal probes $\varnothing 1$ [mm].
- Probe module type TP20 (M2) special C-Line, with vertical probe $\varnothing 2$ [mm].
- Probe module type TP20 (M2) special C-Line, with horizontal probe $\varnothing 2$ [mm].
- Probe module type TP20 (M2) special C-Line, with carbon fiber probe $\varnothing 6$ [mm], L=75 [mm].
- Spare ballpoint pen, in ruby, $\varnothing 2$ [mm], L=20 [mm]
- Modular laying systems (set of 6 or 8 plates)
- Fastening systems (set of 62, 82 or 158 pieces)



Optional modular laying system



Trigger probe module type TP20 special C-Line



Fixation system (model of 82 pieces)

5.

TECHNICAL SPECIFICATIONS



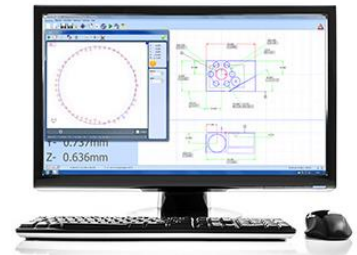
C3 & C4		
Working volume	mm	X and Y Ø 720, Z 250
Diametral Accuracy	µm	3.0 + D(mm)/100
Linear Accuracy	µm	5.0 + L(mm)/100
Fixturing accuracy requirement	mm	5
Machine speed	mm/s	User controlled to 150
Machine air requirement		None required
Construction		Stainless steel for all structural components
Machine power requirements		100-240 V AC±10%, 50-60Hz
Autonomy	h	Normal: 4 /peak: 3
Power consumption	W	Normal: 10 / Peak 15
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	kg (lbs)	13.6 (30)
Machine dimensions (W x D x H)	mm	420 x 172 x 620
Operational Temperature	°C	+10 ÷ +40
Storage Temperature	°C	+10 ÷ +40
Relative Humidity (operation and storage)	%	HR 5 ÷ 75% (non-condensing)

* Specifications subject to change without notice

6.

SOFTWARE

The C-Line works with the following softwares:
Aberlink, CMM Manager, Verisurf, PolyWorks...



The C-Line is delivered standard with the ControlCAT software, which allows you to perform many type of measurements: distance, circle, plane, line, point... and with automatic recognition of shapes, cone, cylinder, sphere...

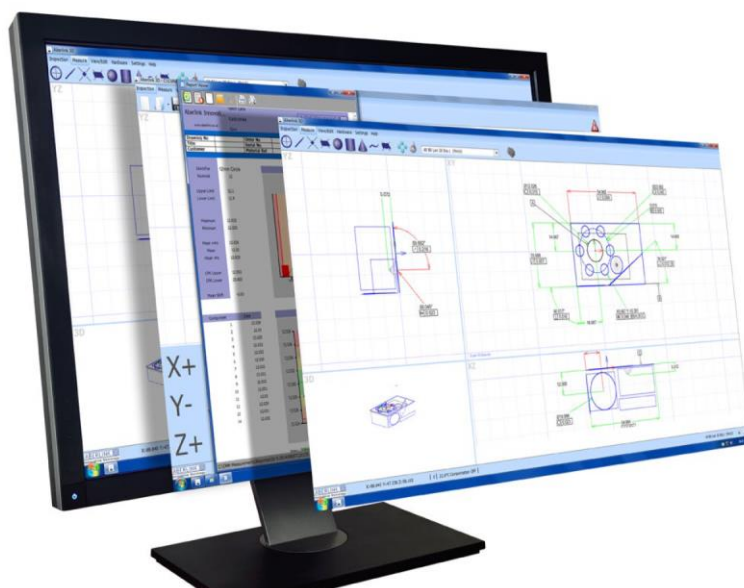


To take full benefit of the performance of the C-Line, we recommend to use the Aberlink software (optional).

Aberlink 3D Measurement Software

It corresponds to the software used with the TRIMOS 3D product family. Aberlink's philosophy is to facilitate measurements. The Aberlink 3D software was written to set the industry standard for easy-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.

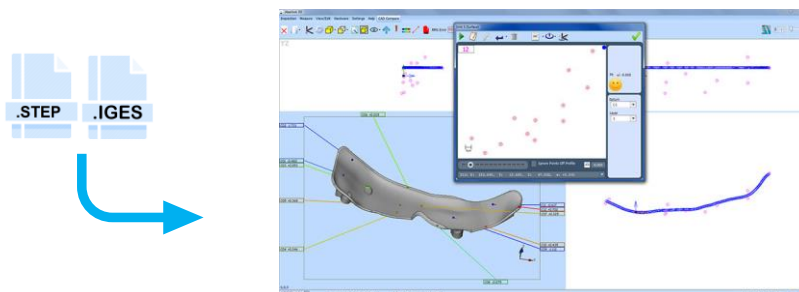


Main window with projections: XY – YZ – XZ – 3D

Modules Aberlink 3D supplémentaire :

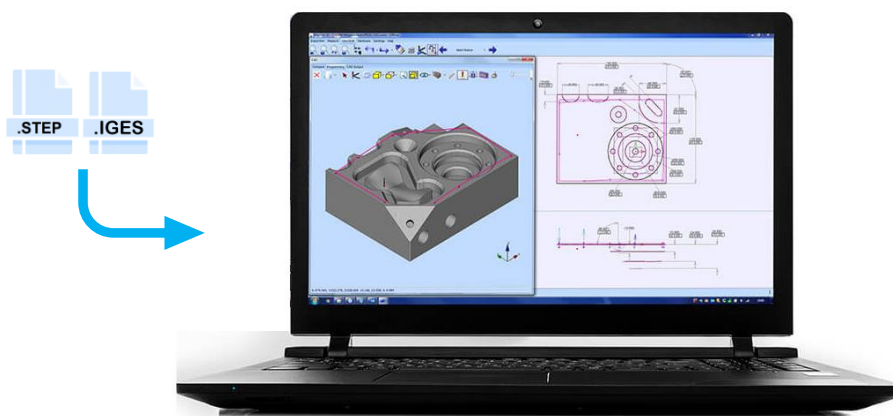
CAD Comparison

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.



Programming from CAD

This module allows the generation of measurement programs from a CAD model (.step, .iges) without physically needing the part. Instead of taking measurement points on a component, you can simply click on the surface of the model where you want the points to be taken.

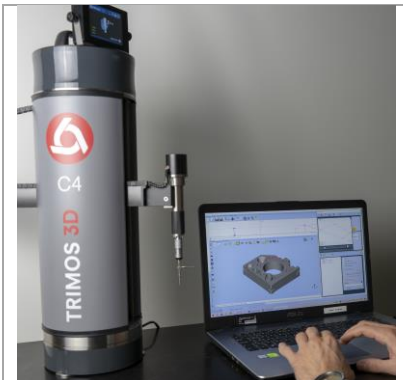
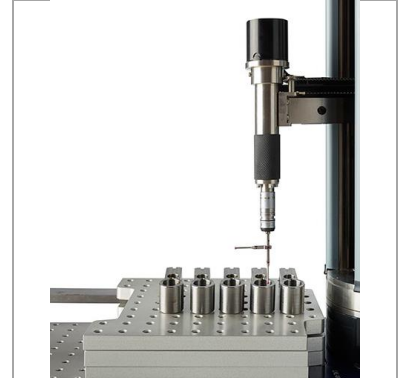
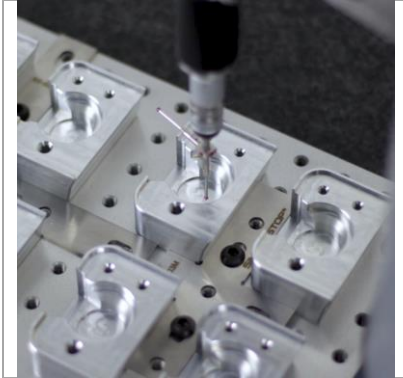


Key Features

Inspection :	Programming :	Report Formats :
<ul style="list-style-type: none"> • Automatic measurement routines • Powerful interactive graphics window • Automatic feature recognition • 2D and 3D inspection • Geometric feature inspection • Free form curve inspection • Export .dxf 	<ul style="list-style-type: none"> • Intuitive programming • Drag and drop program editor • Run programs from any point • Measure a subset of features • Simple object-based programming • No complex programming language 	<ul style="list-style-type: none"> • 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

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APPLICATIONS



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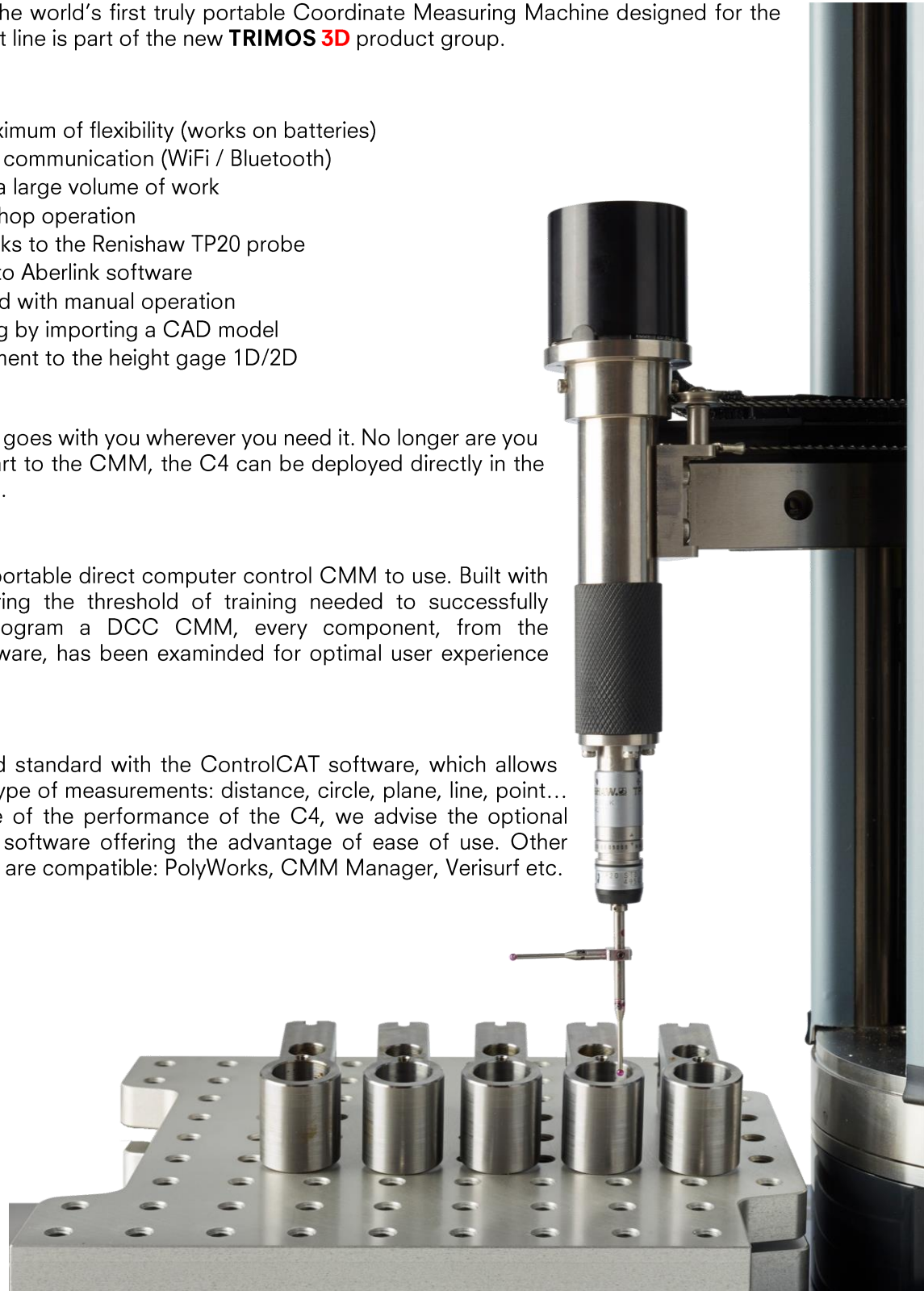
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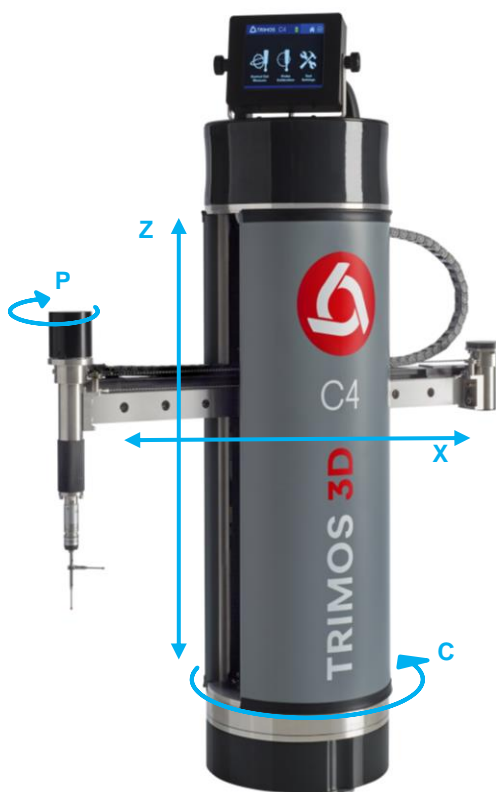


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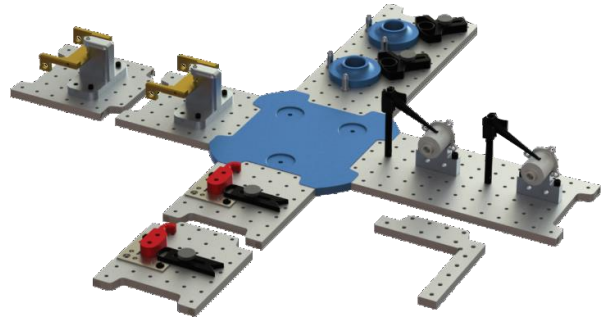
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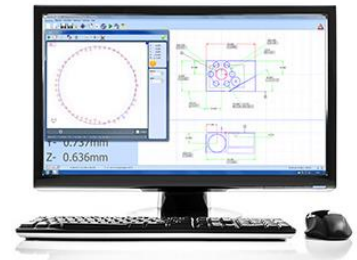
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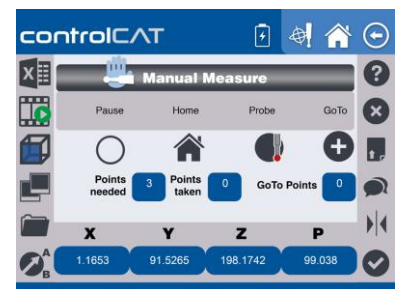
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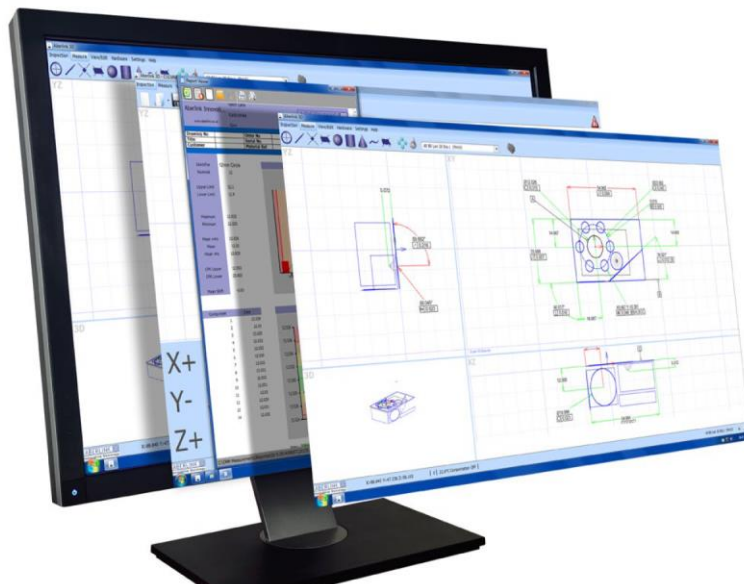


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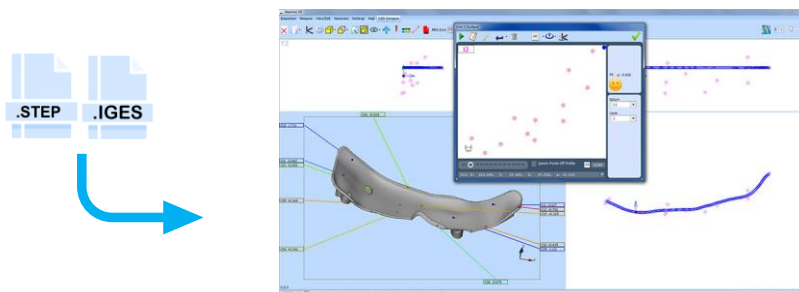


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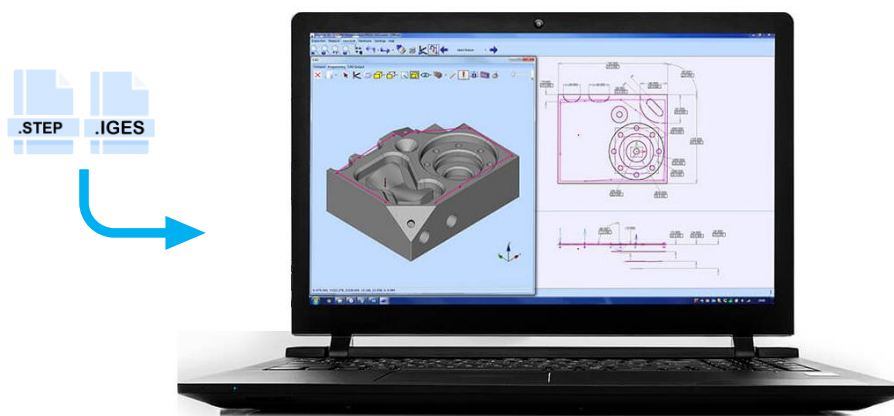
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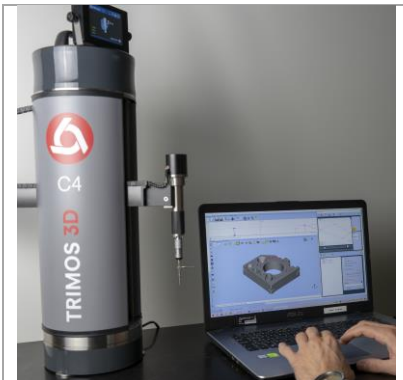
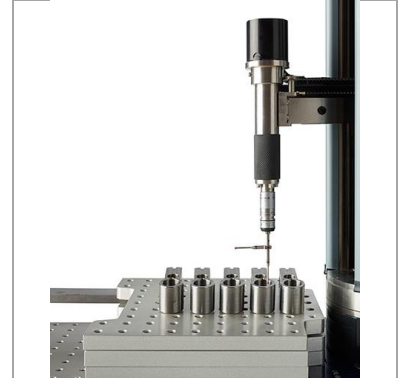
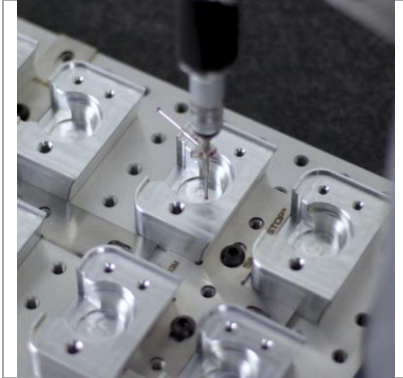


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A3

Portable Measuring Arm with a new handling experience



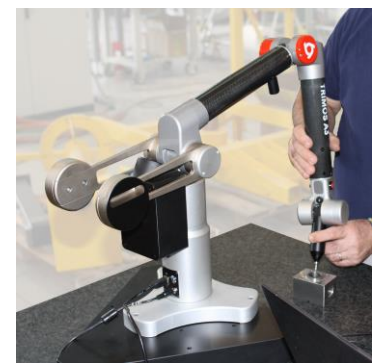
1.

PRESENTATION

The A3 is the newest model of the Trimos A-line portable articulated measuring arms.

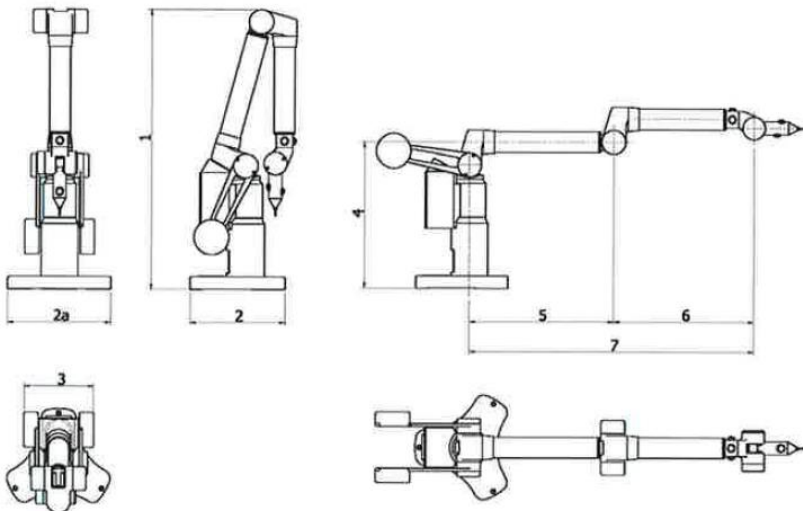
With its extremely easy use, flexibility and accurate 3D measurements, the A3 allows the quality control, inspection and verification of small and large size parts. The 6-axis configuration arm is available at 1300 mm and 1800 mm measuring range. The carbon fiber tubes and aluminum mount base allow to the A3 arm an extremely stable and light structure. With its mass counterbalance an excellent handling experience is guaranteed.

- Measuring ranges up to 1800 mm
- Extremely easy to use, portable and compact measuring instrument
- 6 axis configurations
- Tubes in carbon fiber
- Mechanical probe with ruby stylus sphere, Ø 4mm
- Internal temperature sensor
- Connection by cable or Wireless
- Ø20mm calibrated sphere with magnetic support
- Compatibility with Renishaw autojoint



2.

TECHNICAL SPECIFICATIONS



Dimensions (mm)

	A3-1300	A3-1800
1	639	760
2	214	214
2a	239	239
3	161	175
4	334	334
5	327	452
6	323	448
7	650	900

A3	Axes	Measuring range (mm)	Volumetric accuracy (mm)	Repeatability (mm)	Weight (Kg)
A3 – 1300	6	1300	+/- 0.015	0.008	9.5
A3 – 1800	6	1800	+/- 0.018	0.008	10.4

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A-Line

Portable Measuring Arms A3-A9



1.

PRESENTATION

Trimos new A-line portable articulated measuring arms assure an extremely easy and accurate 3D measurement. The A-line arms certified according to ISO10360-2 or ISO10360-12 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 A3, A4, A5, A6+, A7, A8+, A9 and AT models according to your application.

- Measuring ranges from 250 mm to 9000 mm
- Extremely easy to use
- Certified according to ISO 10360-2 or ISO 10360-12 standard
- Exist in 5, 6 or 7 axis configurations
- Protection with electromagnetic brake
- Connection by cable or Wireless
- Compatibility with Renishaw autojoint



2.

MODELS

A3

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

The 6-axis configuration arm is available at 1300 mm and 1800 mm measuring range. The carbon fiber tubes and aluminum mount base allow to the A3 arm an extremely stable and light structure. With its mass counterbalance an excellent handling experience is guaranteed.

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 a 6 axes configuration. It includes all essential functions and exists in several sizes, from 1800 to 3200 mm measuring range.

The A5 and A6+ arms exist in 6 or 7 axis configurations 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. The A7-A8+ models are equipped an electromagnetic brake on the second axis, which allows 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 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 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)
A3	A3 - 1300	6	1300	0.015	9.5
	A3 - 1800	6	1800	0.018	10.4
A4	A4 - 1800	6	1800	0.025	7.9
	A4 - 2500	6	2500	0.036	8.4
	A4 - 3200	6	3200	0.045	8.8
A5	A5 - 1800	6	1800	0.020	8.4
	A5 - 2500	6	2500	0.026	8.9
	A5 - 3200	6	3200	0.036	9.3
	A5 - 4000	6	4000	0.046	10
A6+	A6+ - 1800	7	1800	0.027	8.9
	A6+ - 2500	7	2500	0.034	9.4
	A6+ - 3200	7	3200	0.045	9.8
	A6+ - 4000	7	4000	0.056	10.5
A7	A7 - 5000	6	5000	0.065	12.5
	A7 - 7000	6	7000	0.080	14
	A7 - 9000	6	9000	0.100	16.5
A8+	A8+ - 5000	7	5000	0.075	13.5
	A8+ - 7000	7	7000	0.090	15
	A8+ - 9000	7	9000	0.110	17.5
A9	A9 - 250	5	250	0.004 + L/50	12
	A9 - 400	5	400	0.006 + L/40	14

4.

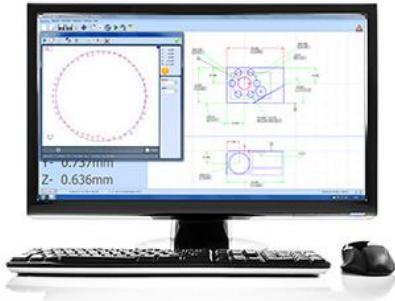
FLEXIBILITY AND PROBABILITY

All arms may be provided with a wireless Bluetooth device, batteries or the two options for a complete wireless portability.



5.

SOFTWARE



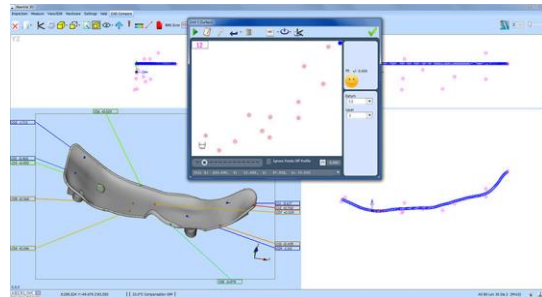
Aberlink 3D Measurement is the software used with our A-line arms. The philosophy for Aberlink is to make measurement easy. Aberlink 3D software has been written by engineers for engineers and sets the industry standard for simple-to-use software.

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Additional Aberlink software module:

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Key Features

Feature Inspection :

- Automatic measurement routines
- Powerful interactive graphics window
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- 2D and 3D inspection
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- Free form curve inspection

Programming Tools :

- Teach & repeat programming
- Drag and drop program editor
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Report Formats :

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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

6.

LASER SCANNER

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

We propose the laser scanner PreciTrack 3D.



PreciTrack 3D		
Speed	Hz, Pts/Sec	300 Hz, 348 000 Pts/Sec
Resolution X -axis	Points/Line	1280
Line Width	mm	25 / 50 / 100
Working Distance	mm	53 / 70 / 190
Working Range	mm	25 / 50 / 100
Resolution	µm	19 / 39 / 78
Material Sensitivity		Light to Dark Shiny to Matt
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

A6+ / A8+ + Scanner**	Measuring range (mm)	Touch probe volum * (mm)	Scanner Laser Accuracy volum ** (mm)	Point Repeatability* (mm)	Wight (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 ** indicatives values

7.

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
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



Pipe measurement by laser fork

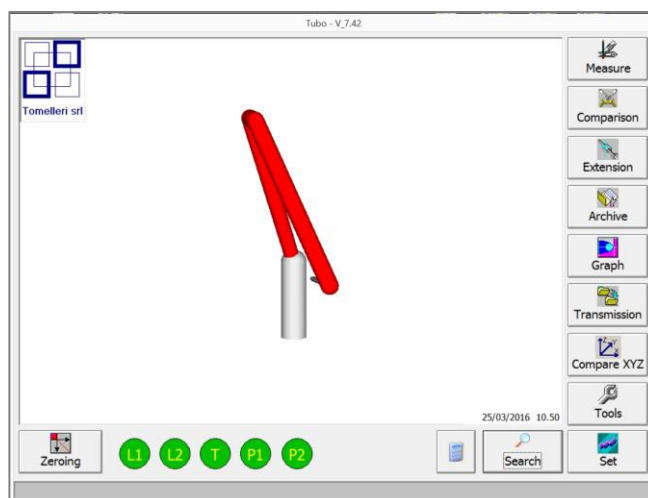


Pipe measurement by touch probe

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.



8.

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.



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)

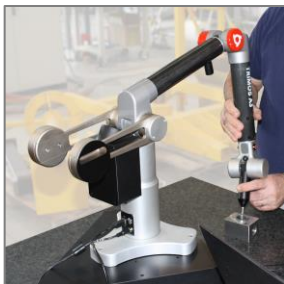
and the weight of the tripod column is balanced by a gas spring. A side handle allows for vertical and horizontal movement of the tripod. A removable and rotary shelf allows positioning of the laptop next to the measuring arm.



- 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.

9.

APPLICATIONS



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