

# ROMER ABSOLUTE ARM

Portable Measuring Arms



# ROMER ABSOLUTE ARM ABSOLUTELY ADVANCED

Designed with infinite rotation in all its joints, the ROMER Absolute Arm is ideal for multiple applications on a wide array of industrial workpieces. The absolute portability of a ROMER arm means you can put it to work all around your facility to take on multiple tasks such as:

- Large Part and Assembly Inspection
- First Article Inspection
- 3D Alignment and Assembly
- On-Machine Inspection and Verification
- Incoming Quality Control

## ABSOLUTE RETURN ON INVESTMENT

**Discover dramatic results with the ROMER Absolute Arm with:**

- Faster inspections
- Perform real time adjustments to equipment on the production floor
- Minimized production wait times
- Scrap and rework reductions
- Elimination of manual data entry

Simply take the measuring arm to the part, switch it on and start measuring.

## INCREASING PRODUCTIVITY ACROSS ALL INDUSTRIES

**Typical Industries include:**

- Automotive
- Aerospace
- Power Generation / Wind Energy
- Forming Industry
- Casting Industry
- Fabricated Metal Products
- Machinery Manufacturing
- Sports Equipment
- Piping and Tubing
- Agriculture and Heavy Equipment
- Ship and Boat Building
- Railway
- Archaeological and Historic Preservation

**Typical Measuring Applications:**

- Sheet Metal Parts
- Dies, Molds and Tooling
- Machined Parts
- Jigs and Fixture Setup and Alignment
- Tubes and Tube Assembly
- CAD-to-Part Comparison
- Alignment
- Reverse Engineering
- Virtual Assembly
- Body-in-White
- On-Machine Tool Inspection
- Composites Inspection
- Die-Casting and Patterns



# ROMER ABSOLUTE ARM EXCLUSIVE FEATURES

## Laser Scanning

The Absolute Arm is available with a high-performance laser scanner. It is the only system on the market to offer fully verifiable scanning system accuracy.

## Faster Inspections

Intelligent Quick Change Probes enable you to swap at any time without the need to recalibrate. Simply change probes and keep on measuring.

## Instant Feedback

The Absolute Arm provides immediate acoustic and sensory feedback to the operator, allowing it to be used in even the harshest industrial environments.





### Switch On and Measure

Absolute encoders “know” where the arm is at all times, eliminating the need to home the arm or wait for it to warm up.

### Accuracy at Any Size

The ROMER Absolute Arm is the largest in the industry. Available in seven lengths between 1.5 m and 4.5 m, there's a size for virtually any application.

### Full System Certification

All ROMER Absolute Arms, including scanning systems, undergo B89.4.22 certification on the complete system.

### Natural Feel

A low profile zero-G counterbalance balances the arm's weight for easy operation with effortless control, even above and below the arm's centerline. Better ergonomics means lower operator fatigue and better measuring results.

### Protect Your Investment

SmartLock locks the Absolute Arm safely into its rest position when it is not in use. It also can be locked in any intermediate position.

### Easy Upgradeability

With user interchangeable feature packs, the functionality of the Absolute Arm can always be upgraded. Current feature packs include wi-fi communication, wi-fi scanning capability and full battery operation.

# ROMER ABSOLUTE ARM PROVING ROI EVERYDAY



“Hexagon Metrology is our valuable and reliable partner, while the ROMER absolute arm guarantees the quality of our products.”

**Marcin Wojciechowski, Solaris,  
Sroda Wielkopolska, Poland**

“By greatly shortening the feedback loop between the production measurement activity and the design process, we’re both saving time and improving results.”

**Steve Ruggiero, senior engineer  
Pratt & Whitney, CT, USA**

“The arms are very good. We are finding errors on components now that we didn’t know we had before. The handling of the arm is excellent compared to previous arms, and the easy changing of probes makes the arms very user friendly.”

**Sam Harper, Red Bull Technology  
Milton Keynes, UK**

“The versatility of the arm made it perfect for our needs: we could immediately see where it would save us time in sled set up, but we’re now finding applications for it that we hadn’t even imagined before.”

**Kristan Bromley, Bromley Technologies  
Rotherham, UK**

“Hexagon Metrology helps us to optimize every area of the car and engine, which drives results on the track. The race engineers are confident that measurements made with the ROMER arms are more accurate than those gathered with previous inspection techniques.”

**Doug Duchardt, vice president of development  
Hendrick Motorsports, NC, USA**

“When you are standing in the middle of the fixture, the absolute encoders on the ROMER arm are superb, because you don’t have to reference them.”

**Peter Haase, Bombardier  
Bautzen, Germany**

“The time saved is the key factor. What used to take days now takes hours. The percentage of scrap tubing has almost been eliminated entirely.”

**Tony Wells, product development manager  
Fabspeed, PA, USA**



## NON-CONTACT LASER SCANNING

The possibilities for 3D laser scanning are limited only by your imagination. Common applications include:

### Inspection and Validation

Laser scanning produces a 3D point cloud for cloud-to-CAD comparison, feature recognition for dimensional inspection, part mating, contour measurement and GD&T analysis.

### Reverse Engineering

Parts are quickly digitized and the resulting 3D model can be converted to CAD to describe a sample or prototype part.

### Rapid Prototyping

A sample part or physical model is scanned and converted to an STL file representation of the part, which can then be reproduced with a 3D printer.

### Copy Milling

CAM software is used to read the scanned data and produce machining instructions for machine tools.

### Historical Preservation

3D scans of priceless artifacts can be created without touching them. This aids in archival, preservation or restoration work and also allows the creation of a 3D record, model or copy.



# ROMER ABSOLUTE ARM

## THE RIGHT TOOLS FOR YOUR APPLICATION



### ROMER ABSOLUTE ARM WITH SIX MOVEMENT AXES

The ROMER Absolute Arm with six rotational axes is designed for highly accurate tactile measurement. It allows reliable inspection of features on sheet metal parts, plastic components or carbon-fiber structures. A new ergonomic wrist is the first to be designed around the complex contours of the human hand. Intelligent Quick Change Probes do not need special tools or even recalibration.



### ROMER ABSOLUTE ARM WITH INTEGRATED LASER SCANNER

The ROMER Absolute Arm with a fully integrated laser scanner system is an all-purpose metrology tool for a multitude of applications. Use it for 3D digitizing, 3D modelling, point cloud inspection, reverse engineering, rapid prototyping or copy milling. The laser scanner may be used on a variety of materials without compromising its accuracy. ROMER's integrated laser scanner does not need warm-up time or additional cables and controllers. Changing from scanning to probing and vice versa and does not require recalibration.



## ROMER ABSOLUTE ARM WITH EXTERNAL LASER SCANNER

The ROMER Absolute Arm with external scanner is a modular high-end laser scanning platform. Designed for the CMS108 laser scanner from Hexagon Metrology, it offers first-class performance on complex surfaces and challenging materials. The CMS108 automatically adjusts to surface color and reflectivity. It is the first laser scanner with a zoom function, providing three different line widths. Third-party scanners may also be used.



## ROMER TUBE INSPECTION SOLUTION

The ROMER Tube Inspection Solution measures bend paths for tube inspections and reverse engineering applications. The system is capable of interfacing directly with a CNC tube bending machine for instant corrections. The ROMER Tube Inspection Solution is the only portable true tube inspection solution on the market. It can be used in the field to measure and reverse engineer pipes, lines, and tubes to fabricate replacements on the spot for process industries and MRO applications.

# ROMER ABSOLUTE ARM **SPECIFICATION CHARTS**

A close-up photograph of a Romer Absolute Arm probe tip. The probe is a long, cylindrical metal arm with a red spherical tip. The background is dark and out of focus. A blue horizontal line is positioned below the title. Two dotted lines, one blue and one yellow, form a triangle pointing towards the probe tip.

## 6-AXIS PROBING SPECIFICATIONS

	Model	Measuring range	Point repeatability <sup>1</sup>	Volumetric accuracy <sup>2</sup>	Arm weights
73 series	7315	1.5 m / 4.9 ft.	0.025 mm / 0.0010 in.	± 0.037 mm / 0.0015 in.	7.1 kg / 15.6 lbs
	7320	2.0 m / 6.6 ft.	0.030 mm / 0.0012 in.	± 0.042 mm / 0.0017 in.	7.4 kg / 16.3 lbs
	7325	2.5 m / 8.2 ft.	0.038 mm / 0.0015 in.	± 0.051 mm / 0.0020 in.	7.7 kg / 17.0 lbs
	7330	3.0 m / 9.8 ft.	0.059 mm / 0.0023 in.	± 0.075 mm / 0.0030 in.	8.0 kg / 17.6 lbs
	7335	3.5 m / 11.5 ft.	0.079 mm / 0.0031 in.	± 0.100 mm / 0.0039 in.	8.3 kg / 18.3 lbs
	7340	4.0 m / 13.1 ft.	0.099 mm / 0.0039 in.	± 0.125 mm / 0.0049 in.	8.6 kg / 19.0 lbs
	7345	4.5 m / 14.8 ft.	0.120 mm / 0.0047 in.	± 0.150 mm / 0.0059 in.	8.9 kg / 19.6 lbs
75 series	7520	2.0 m / 6.6 ft.	0.016 mm / 0.0006 in.	± 0.023 mm / 0.0009 in.	7.7 kg / 17.0 lbs
	7525	2.5 m / 8.2 ft.	0.020 mm / 0.0008 in.	± 0.029 mm / 0.0011 in.	8.0 kg / 17.6 lbs
	7530	3.0 m / 9.8 ft.	0.030 mm / 0.0012 in.	± 0.044 mm / 0.0017 in.	8.3 kg / 18.3 lbs
	7535	3.5 m / 11.5 ft.	0.040 mm / 0.0016 in.	± 0.057 mm / 0.0022 in.	8.6 kg / 19.0 lbs
	7540	4.0 m / 13.1 ft.	0.055 mm / 0.0022 in.	± 0.069 mm / 0.0027 in.	8.9 kg / 19.6 lbs
	7545	4.5 m / 14.8 ft.	0.070 mm / 0.0028 in.	± 0.082 mm / 0.0032 in.	9.2 kg / 20.3 lbs

All specifications according to B89.4.22 and VDI/VDE 2617-9.

## 7-AXIS PROBING AND SCANNING SPECIFICATIONS

	Model <sup>3</sup>	Measuring range	Probing point repeatability <sup>1</sup>	Probing volumetric accuracy <sup>2</sup>	Scanning system accuracy SI <sup>4</sup> (with RS2)	Scanning system accuracy SE <sup>4</sup> (with CMS108)	Arm weights SI	Arm weights SE
73 series	7320SI/SE	2.0 m / 6.6 ft.	0.044 mm / 0.0017 in.	± 0.061 mm / 0.0024 in.	± 0.040 mm / 0.0016 in.	± 0.038 mm / 0.0015 in.	8.3 kg / 18.3 lbs	7.9 kg / 17.4 lbs
	7325SI/SE	2.5 m / 8.2 ft.	0.049 mm / 0.0019 in.	± 0.069 mm / 0.0027 in.	± 0.042 mm / 0.0017 in.	± 0.040 mm / 0.0016 in.	8.6 kg / 19.0 lbs	8.2 kg / 18.1 lbs
	7330SI/SE	3.0 m / 9.8 ft.	0.079 mm / 0.0031 in.	± 0.100 mm / 0.0039 in.	± 0.060 mm / 0.0024 in.	± 0.057 mm / 0.0022 in.	8.9 kg / 19.6 lbs	8.5 kg / 18.7 lbs
	7335SI/SE	3.5 m / 11.5 ft.	0.099 mm / 0.0039 in.	± 0.125 mm / 0.0049 in.	± 0.074 mm / 0.0029 in.	± 0.070 mm / 0.0028 in.	9.2 kg / 20.3 lbs	8.8 kg / 19.4 lbs
	7340SI/SE	4.0 m / 13.1 ft.	0.115 mm / 0.0045 in.	± 0.151 mm / 0.0059 in.	± 0.091 mm / 0.0036 in.	± 0.086 mm / 0.0034 in.	9.5 kg / 20.9 lbs	9.1 kg / 20.1 lbs
	7345SI/SE	4.5 m / 14.8 ft.	0.141 mm / 0.0056 in.	± 0.179 mm / 0.0070 in.	± 0.107 mm / 0.0042 in.	± 0.102 mm / 0.0040 in.	9.8 kg / 21.6 lbs	9.4 kg / 20.7 lbs
75 series	7520SI/SE	2.0 m / 6.6 ft.	0.023 mm / 0.0009 in.	± 0.033 mm / 0.0013 in.	± 0.029 mm / 0.0012 in.	± 0.027 mm / 0.0011 in.	8.6 kg / 19.0 lbs	8.2 kg / 18.1 lbs
	7525SI/SE	2.5 m / 8.2 ft.	0.027 mm / 0.0011 in.	± 0.038 mm / 0.0015 in.	± 0.032 mm / 0.0013 in.	± 0.029 mm / 0.0012 in.	8.9 kg / 19.6 lbs	8.5 kg / 18.7 lbs
	7530SI/SE	3.0 m / 9.8 ft.	0.042 mm / 0.0017 in.	± 0.058 mm / 0.0023 in.	± 0.042 mm / 0.0017 in.	± 0.039 mm / 0.0016 in.	9.2 kg / 20.3 lbs	8.8 kg / 19.4 lbs
	7535SI/SE	3.5 m / 11.5 ft.	0.055 mm / 0.0022 in.	± 0.081 mm / 0.0032 in.	± 0.051 mm / 0.0020 in.	± 0.048 mm / 0.0019 in.	9.5 kg / 20.9 lbs	9.1 kg / 20.1 lbs
	7540SI/SE	4.0 m / 13.1 ft.	0.067 mm / 0.0026 in.	± 0.098 mm / 0.0039 in.	± 0.060 mm / 0.0024 in.	± 0.057 mm / 0.0023 in.	9.8 kg / 21.6 lbs	9.4 kg / 20.7 lbs
	7545SI/SE	4.5 m / 14.8 ft.	0.084 mm / 0.0033 in.	± 0.119 mm / 0.0047 in.	± 0.070 mm / 0.0027 in.	± 0.067 mm / 0.0026 in.	10.1 kg / 22.3 lbs	9.7 kg / 21.4 lbs

All specifications in relation to B89.4.22.

## LASER SCANNERS

	Configurations	Integrated scanner RS2	External scanner CMS108
Scanning sensor specification	Max. point acquisition rate	50,000 Points/s	30,000 Points/s
	Points per Line	1000	max. 2000
	Line rate	50 Hz	max. 53 Hz
	Line width (mid range)	65 mm	124 mm / 60 mm / 25 mm
	Stand off (mid range)	150 mm ± 50 mm	180 mm ± 40 mm
	Minimum point spacing (mid range)	0.046 mm	0.025 mm
	Laser power control	Semi-automatic – per line	Fully automatic – per point
	Accuracy (2 sigma)	30 µm	20 µm
	Weight	340 g	398 g
	Controller	No	Yes
	Laser safety	Class 2M	Class 2
	Working temperature	5°C – 40°C (41°F – 104°F)	10°C – 42°C (50°F – 108°F)

<sup>1</sup> The **Point Repeatability Test** is the reference test to determine measurement arm repeatability with ball probe. The cone is in front of the machine. Points are measured from multiple approach directions. The average point and the deviation of each point to the average center are calculated. The result is the maximum range divided by two.

<sup>2</sup> The **Volumetric Accuracy Test** most accurately represents the reasonable expectations for machine performance in practical measuring applications since it involves measuring a certified length standard many times in several locations and orientations and compares the resultant measurements to the actual length. The Volumetric Length Accuracy Test is the most appropriate test for determining machine accuracy and repeatability. The result is the maximum deviation of the measuring distance less the theoretical length.

### Ambient conditions

Working temperature: 0°C – 50°C (32°F – 122°F)  
Storage temperature: -30° – 70°C (-22°F – 158°F)  
Relative humidity: 10% – 90% non-condensing  
Operational elevation: 0 – 2000 m (0 – 6600 ft)

### Marks of conformity

CE Compliance: Yes

### Power requirement

Universal worldwide voltage: 110V – 240V

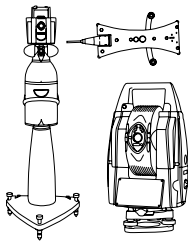
<sup>3</sup> **SI** designates the ROMER Absolute Arm with integrated scanner, **SE** designates the ROMER Absolute Arm with external scanner.

<sup>4</sup> **The Scanning System Accuracy Test** most accurately represents the reasonable expectations for machine performance in practical measuring applications while using the laser scanning method. The test consists of measuring a matte grey sphere with 5 different arm articulations. In each articulation of the arm the sphere is scanned from 5 different directions such that the majority of the sphere is scanned. The result is the maximum 3D center to center distance of the 5 spheres.

All probing specifications are achieved with a ROMER Absolute Arm mounted on a ROMER base plate or magnetic base and using a 15 mm steel ball probe with a length of 50 mm under stable environmental conditions.

All RS2 scanning specifications are achieved with a ROMER Absolute Arm mounted on a ROMER base plate or magnetic base and a matte grey calibration sphere of 25.4 mm diameter under stable environmental conditions.

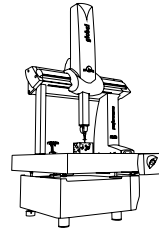




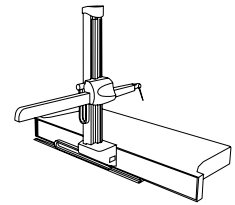
Laser Trackers & Stations



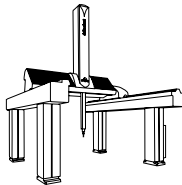
Portable Measuring Arms



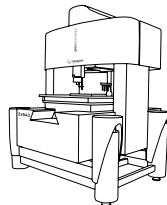
Bridge CMMs



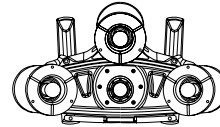
Horizontal Arm CMMs



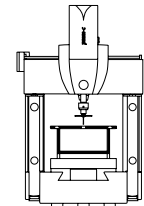
Gantry CMMs



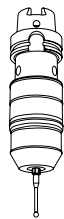
Multisensor & Optical Systems



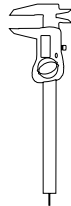
White Light Scanners



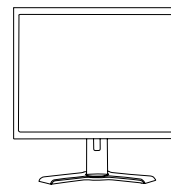
Ultra High Accuracy CMMs



Sensors



Precision Measuring Instruments



Software Solutions



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METROLOGY

Hexagon Metrology offers a comprehensive range of products and services for all industrial metrology applications in sectors such as automotive, aerospace, energy and medical. We support our customers with actionable measurement information along the complete life cycle of a product – from development and design to production, assembly and final inspection.

With more than 20 production facilities and 70 Precision Centers for service and demonstrations, and a network of over 100 distribution partners on five continents, we empower our customers to fully control their manufacturing processes, enhancing the quality of products and increasing efficiency in manufacturing plants around the world.

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