

ABSOLUTE ARM

USABILITY | VERSATILITY | PRODUCTIVITY | BY DESIGN





The New Absolute Arm (MULTI) FUNCTIONAL BY DESIGN

With the Absolute Arm, it's all in the design. Design for high measurement productivity, so other manufacturing processes can stay on schedule. Design for practicality, so users can measure in almost any industrial environment. Design for flexibility, to meet the demands of any metrology challenge, anywhere.

And flexibility is at the core of the Absolute Arm product range. Flexibility in configuring the arm's wrist for the needs of the application and the comfort of the operator. Flexibility in swapping probes without having to stop work and calibrate. Flexibility in having measurement results displayed where they're needed. Flexibility in a product range of 36 different configurations across three types, seven sizes and three accuracy levels. Flexibility in finding the right solution for every measurement need.

With the Absolute Arm there's no need to compromise, no need to settle for second best. Whatever, wherever and however we want to measure, the right choice is right there, by design.



THE ABSOLUTE ARM ALL IN THE DESIGN

Built on a platform of advanced technology, the Absolute Arm makes high-accuracy portable measurement effortless. Every part has been designed with practicality, usability and stability in mind. The product of over 35 years of experience in developing articulated measuring arms, it combines a clear picture of the future of portable metrology with the features that users have always wanted to see.

Encoders

The Absolute Encoders within every articulated joint are exclusive to Hexagon and make the Absolute Arm the only portable measuring arm that has completely eliminated warm-up times and encoder referencing before use.



Movement

The unique Zero-G Counter-Balance system and low-friction rotating grips reduce user fatigue and maximise accuracy by minimising inertia.



Measurement

Multi-functional control buttons and a convenient wrist display screen put measurement control directly in the user's hand, while a range of probes and the RS5 Laser Scanner deliver flexible measurement.



Materials

High-tech carbon-fibre tube construction ensures strength and thermal stability under any environmental conditions.



Security

The HomeDock and SmartLock features allow the arm to be stowed and locked in place between measurements, for greater security during transport, set-up and station moves.



Feedback

Easy user interaction in even the harshest industrial environments through visual, acoustic and haptic feedback functions, now augmented with Bluetooth technology.



Customise

Easily interchangeable Control Packs deliver WiFi connectivity and battery power, for completely portable wireless measurement – no more messy cables on the shop floor.



USABILITY BY DESIGN

Every key characteristic of the Absolute Arm has been designed to make it the most reliable and easy-to-use piece of advanced technology in the modern metrology toolkit.

Even the largest Absolute Arm weighs less than 11 kilograms, making set up and repositioning a quick and easy process.



PORTABILITY



RESILIENCE

The robust and shock-resistant carry case keeps the arm reliable wherever and however it is transported.

An established and reliable software interface that is compatible with and supported by all major portable metrology software packages.



COMPATIBILITY



MONITORING

The SMART – Self-Monitoring Analysis and Reporting Technology – system provides full diagnostic monitoring for comprehensive measurement reliability.

Probing accuracy as fine as only 6 microns and scanning system accuracy to within 44 microns.



ACCURACY



REPEATABILITY

A patented kinematic probe joint minimises downtime by allowing all probes to be swapped on the fly with no need for recalibration.

Supplied with all the certified measurement artefacts needed to allow users to verify the accuracy of their results on site, without outside support.

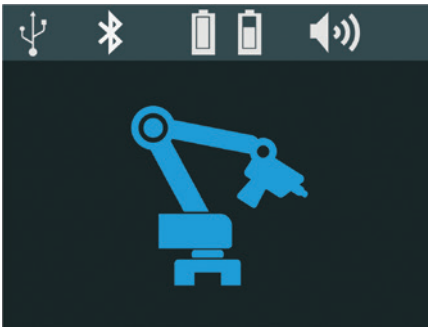


VERIFICATION

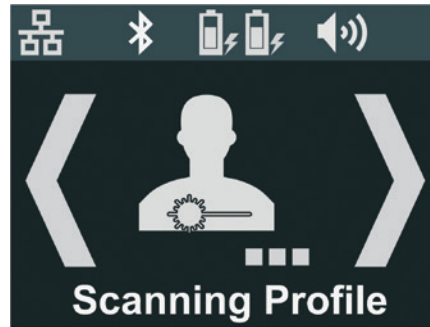


CERTIFICATION

Probing accuracy certified to ISO 10360-12 as standard, along with full scanning system accuracy specification to ISO 10360-8 Annex D.



Monitor measurement results.



Switch measurement profiles on the fly.



LCD WRIST DISPLAY

The flexibility of the Absolute Arm is greatly enhanced by the ever-present, ever-useful wrist display and its Quick Access Menu, which puts all the most useful information right at the point of measurement, exactly where it's needed most.

VERSATILITY BY DESIGN

The unique modular wrist of the Absolute Arm has been specifically designed to make measurement flexible, fast and secure.

- Quickly switch between laser scanning and touch probing without interrupting the measurement process.
- Pistol grips available in three different sizes – choose the most comfortable fit for the user.
- Remove the grip completely to measure hard-to-reach areas such as holes and cavities.
- For measurement in the tightest areas even the RS5 Laser Scanner can be removed, and as with all Hexagon probes and scanners, quickly replaced later with no need for recalibration.

Whatever the use case, the flexible modular design of the Absolute Arm makes it instantly adaptable and always ready to measure.







PORTABLE LASER SCANNING

The flagship non-contact measurement solution for the Absolute Arm is the RS5 Laser Scanner. It delivers established and reliable 3D scanning technology at high speed. Designed for fast and easy digitisation of surfaces and features, whatever the finish or material, the horizontally oriented laser of the RS5 is the definition of ergonomic, easy-to-use non-contact measurement.

A wide scan line means parts can be scanned with fewer passes and therefore less time taken. The scanner can be removed from the arm and replaced – even during measurement – with no need for recalibration. All this comes without sacrificing greater laser width to achieve a higher frame rate – with the RS5, all the performance is delivered all of the time: maximum frame rate at maximum laser width.

High-speed laser scanning has never been so flexible and accessible.



PORTABLE PROBING

The Absolute Arm is the absolute standard when it comes to reliable high-accuracy point probe measurement, delivering market-leading probing accuracy.

Every arm is supplied with three pre-calibrated touch probes, so measurement can begin immediately. The established TESA kinematic joint for repeatable probe mounting means probes can be hot-swapped quickly and easily, with no need for recalibration between changes.

With almost 100 probes available within the Absolute Arm accessory range, there's definitely one that suits every measurement need. Straight probes, angled probes, trigger probes, tube probes – all are available at various lengths and tip diameters. Take a look at the comprehensive Absolute Arm Accessories Catalogue for more details.

A PROBING SPECIALIST, BY DESIGN

The Absolute Arm is also available in a 6-axis model. These dedicated probing systems are built on well-established measurement technology and intended for applications where laser scanning is less important. The Absolute Arm 6-Axis offers the same probing functionality as the full 7-axis models while delivering improved probing accuracy to within just 8 microns. It's also fully upgradeable to basic laser scanning with the addition of the HP-L-8.9 Laser Scanner.



THE WORLD'S MOST ACCURATE PORTABLE MEASURING ARM

Combining ultra-high accuracy with small size, the Absolute Arm Compact is designed for optimum results in tight spaces.

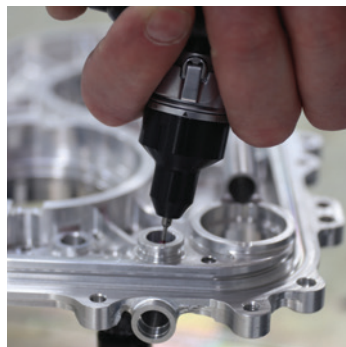
Featuring an integrated base and a unique counter-weight balancing system for improved ease-of-use, the Absolute Arm Compact can be placed anywhere, even inside a machining centre for part alignment. This is high accuracy, guaranteed where it's needed most. The Compact is also fully compatible with WiFi and battery-operation Control Pack options, as well as the HP-L-8.9 Laser Scanner.

Put simply, the Absolute Arm Compact is still the world's most accurate portable measuring arm, with accuracy achievable to within just 6 microns. It's an incredible package of advanced portable technology that represents the perfect choice for measuring small-to-medium parts with absolute accuracy.

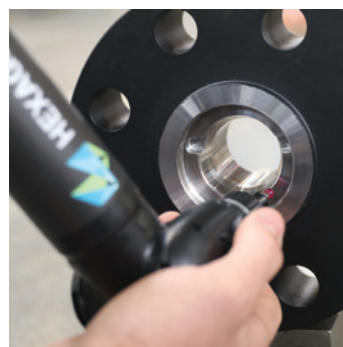


ABSOLUTE ARM APPLICATIONS

The Absolute Arm range is a single solution to measurement challenges across a wide range of industries and applications. From quality control to reverse engineering, from sheet metal production to engine components, there's an Absolute Arm for every measurement need.



JIG AND FIXTURE
BUILD AND INSPECT
TUBE AND WIRE



SHEET METAL
MOULD AND DIE
SHOP FLOOR





COMPOSITE INSPECTION
IN-PROCESS CHECKS
DIGITISING



CAD-TO-PART
REVERSE ENGINEERING
VIRTUAL ASSEMBLY



GEAR MEASUREMENT
ON-MACHINE
VERIFICATION
MAINTENANCE AND
REPAIR

ABSOLUTE ARM SERIES AND SIZES

The three types of Absolute Arm are available in three different accuracy levels and seven model sizes, with measurement volume diameters from 1.2 to 4.5 metres, for a total of 36 individual configurations.



87 SERIES
ULTIMATE SOLUTION
FOR PORTABLE
HIGH-ACCURACY
MEASUREMENT



85 SERIES
PERFECT BALANCE
BETWEEN VALUE FOR
MONEY AND ACCURATE
MEASUREMENT



83 SERIES
ENTRY-LEVEL
MEASUREMENT
ACCURACY





Measurement volume

| | 1.2 m | 2.0 m | 2.5 m | 3.0 m | 3.5 m | 4.0 m | 4.5 m |
|----|-------|-------|-------|-------|-------|-------|-------|
| 83 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 85 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 87 | | | ✓ | ✓ | ✓ | ✓ | ✓ |



MEASUREMENT VOLUME



MAXIMUM REACH

ABSOLUTE ARM ACCESSORIES

All Absolute Arm models are compatible with a wide range of functional and effective accessories, from scanners and probes to mounting and volume expansion systems. Discover the full range in the Absolute Arm Accessories Catalogue.

HP-L-8.9 LASER SCANNER

Accessible and user-friendly, the HP-L-8.9 Laser Scanner can turn Absolute Arm 6-Axis systems into simple laser scanning solutions.

HP-L-20.8 LASER SCANNER

With advanced 'flying-dot' laser scanning technology, the HP-L-20.8 is an alternative laser scanning solution for 7-axis arms designed for challenging measurement surfaces.

| Laser Scanner Specifications | HP-L-8.9 | HP-L-20.8 |
|--------------------------------|-----------------------|-----------------------------|
| Accuracy | 0.04 mm (2 σ) | 0.009 mm (1 σ) |
| Probing Dispersion Value | - | 0.036 mm* |
| Maximum Point Acquisition Rate | 45 000 points/s | 150 000 points/s |
| Points per Line | 750 | 4000 |
| Line Rate | 60 Hz | 100 Hz |
| Line Width (mid) | 80 mm | 220 / 130 / 63 / 51 / 25 mm |
| Standoff | 135 \pm 45 mm | 180 \pm 40 mm |
| Minimum Point Spacing | 0.08 mm | 0.013 mm |
| System Scanning Certification | no | yes |
| Laser Class | 2 | 2 |
| Operating Temperature | 5–40°C | 5–40°C |
| Weight | 0.32 kg | 0.41 kg |



PROBES

From infrared non-contact probes for measuring tubes of different diameters, to angled probes for measuring difficult to access features, the Absolute Arm is compatible with almost 100 versatile probing options.

MOUNTING OPTIONS

A selection of bases, tripods and stands is compatible with every Absolute Arm, including a convenient vacuum mount, all attachable through our specially designed Mounting Ring.



LARGE-VOLUME MEASUREMENT

Volume expansion accessories allow the Absolute Arm to measure parts and objects beyond its standard reach.

Extended measurement can be achieved with a Leap Frog Kit that allows the arm to measure from different stations. For more demanding applications, the GridLOK system creates an expanded measurement arena within which the arm can be repositioned anywhere with no undue loss of accuracy.



CERTIFYING ABSOLUTE ACCURACY

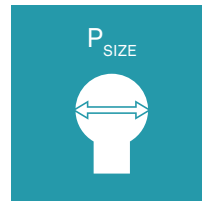
All Absolute Arms are delivered with fully traceable internationally recognised accuracy certifications, giving users complete confidence in the reliability of their measurements.

ISO 10360-12 CERTIFICATION

Every Absolute Arm is delivered fully certified to the ISO 10360-12 standard for probing. This is an extremely demanding internationally recognised standard for defining the probing accuracy of portable measuring arms.

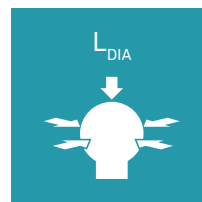
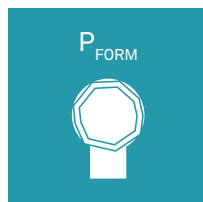
The ISO 10360-12 standard requires that certified length and sphere artefacts be measured multiple times in different positions within the arm measurement volume with a touch probe. The results of these measurements provide four accuracy results that together represent the arm's overall accuracy for contact measurement.

The E_{UNI} value is the maximum permissible error for unidirectional length measurements. It therefore most closely reflects most measurement needs.



The P_{SIZE} value is the maximum permissible error for measuring the diameter of a sphere. It therefore signifies the accuracy of feature measurements.

The P_{FORM} value is the maximum permissible error for the form of a sphere. This is a value that defines the dispersion accuracy of the arm.



The L_{DIA} value is the maximum permissible error for the articulation location. It therefore represents the repeatability of the arm.



SCANNING SYSTEM ACCURACY

A full system scanning accuracy certification in line with the ISO 10360-8 Annex D standard is supplied with every Absolute Arm scanning system. This represents the global accuracy of the arm and scanner together.

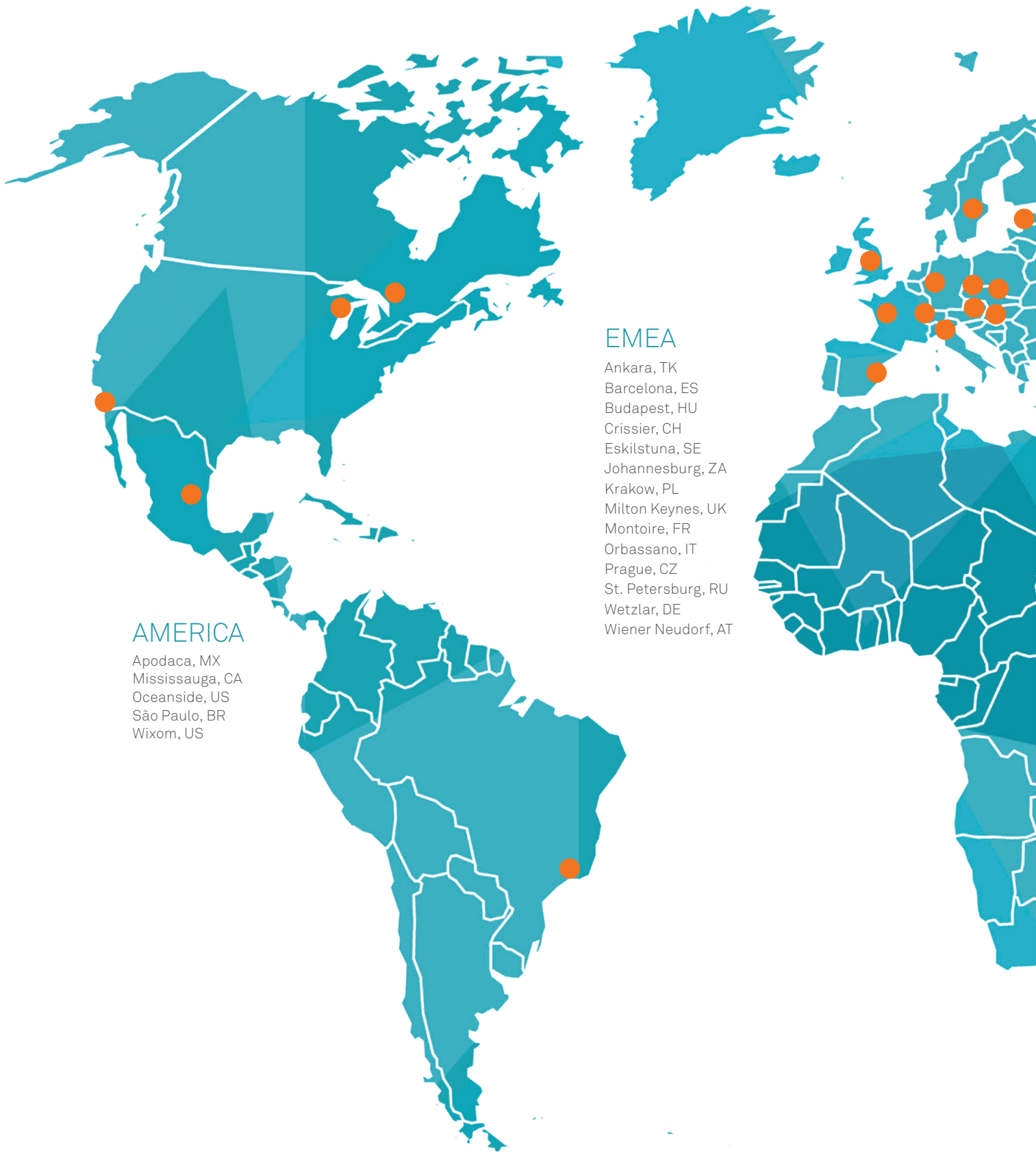
The test involves measuring a certified sphere artefact with five different arm articulations, in different locations throughout the arm measurement volume. A certified sphere artefact is supplied with every Absolute Arm scanning system.

ISO 10360-2 CERTIFICATION

The Absolute Arm Compact is available with optional ISO 10360-2 certification. This is a CMM-type certification that quotes the arm accuracy according to a variable 'L', where 'L' is equal to the length of measurement that is being performed. A higher L-value denotes a larger measurement distance, such that ISO-certified accuracy increases with lower L-values. This is a useful option for users who plan to use their Absolute Arm Compact in conjunction with a bridge, gantry, vision or horizontal-arm CMM.

USER VERIFICATION

Every Absolute Arm system comes with the appropriate certified artefacts. These allow users to self-verify that their equipment remains within the expected measurement parameters defined during certification and calibration, for transparent peace of mind and confident measurement.



AMERICA

Apodaca, MX
Mississauga, CA
Oceanside, US
São Paulo, BR
Wixom, US

EMEA

Ankara, TK
Barcelona, ES
Budapest, HU
Crissier, CH
Eskilstuna, SE
Johannesburg, ZA
Krakow, PL
Milton Keynes, UK
Montoire, FR
Orbassano, IT
Prague, CZ
St. Petersburg, RU
Wetzlar, DE
Wiener Neudorf, AT



MAINTAINING ABSOLUTE ACCURACY

Hexagon's leading products are backed up by a leading support network. Any time it's required, users can be sure to have access to global quality support, delivered locally. With over 30 Service Centres around the world, there's always one nearby.

- System certification to ISO 10360-12 and ISO 10360-2
- System calibrations
- All trouble-shooting and repairs

ABSOLUTE ARM SPECIFICATIONS

ABSOLUTE ARM 7-AXIS ACCURACY AND SIZE SPECIFICATION

| | Model | E _{UNI} ¹ | P _{SIZE} ² | L _{DIA} ³ | P _{FORM} ⁴ | SSA ⁵ | Weight ⁶ | Max. reach |
|-----------|--------|-------------------------------|--------------------------------|-------------------------------|--------------------------------|------------------|---------------------|------------|
| 83 series | 8320-7 | 0.043 mm | 0.016 mm | 0.054 mm | 0.033 mm | 0.062 mm | 8.8 kg | 2.48 m |
| | 8325-7 | 0.048 mm | 0.023 mm | 0.060 mm | 0.043 mm | 0.068 mm | 9.1 kg | 2.98 m |
| | 8330-7 | 0.078 mm | 0.034 mm | 0.090 mm | 0.058 mm | 0.092 mm | 9.4 kg | 3.48 m |
| | 8335-7 | 0.092 mm | 0.042 mm | 0.115 mm | 0.067 mm | 0.105 mm | 9.7 kg | 3.98 m |
| | 8340-7 | 0.114 mm | 0.051 mm | 0.140 mm | 0.084 mm | 0.122 mm | 10.0 kg | 4.48 m |
| | 8345-7 | 0.158 mm | 0.078 mm | 0.168 mm | 0.106 mm | 0.172 mm | 10.3 kg | 4.98 m |
| 85 series | 8520-7 | 0.029 mm | 0.010 mm | 0.038 mm | 0.021 mm | 0.045 mm | 9.0 kg | 2.48 m |
| | 8525-7 | 0.031 mm | 0.012 mm | 0.048 mm | 0.025 mm | 0.048 mm | 9.3 kg | 2.98 m |
| | 8530-7 | 0.057 mm | 0.020 mm | 0.083 mm | 0.038 mm | 0.066 mm | 9.6 kg | 3.48 m |
| | 8535-7 | 0.069 mm | 0.024 mm | 0.099 mm | 0.045 mm | 0.080 mm | 9.9 kg | 3.98 m |
| | 8540-7 | 0.084 mm | 0.030 mm | 0.120 mm | 0.050 mm | 0.091 mm | 10.2 kg | 4.48 m |
| | 8545-7 | 0.113 mm | 0.048 mm | 0.140 mm | 0.065 mm | 0.148 mm | 10.5 kg | 4.98 m |
| 87 series | 8725-7 | 0.029 mm | 0.011 mm | 0.044 mm | 0.023 mm | 0.044 mm | 9.3 kg | 2.98 m |
| | 8730-7 | 0.053 mm | 0.018 mm | 0.076 mm | 0.035 mm | 0.058 mm | 9.6 kg | 3.48 m |
| | 8735-7 | 0.064 mm | 0.022 mm | 0.092 mm | 0.041 mm | 0.071 mm | 9.9 kg | 3.98 m |
| | 8740-7 | 0.078 mm | 0.028 mm | 0.110 mm | 0.046 mm | 0.082 mm | 10.2 kg | 4.48 m |
| | 8745-7 | 0.104 mm | 0.044 mm | 0.125 mm | 0.060 mm | 0.127 mm | 10.5 kg | 4.98 m |

RS5 LASER SCANNER SPECIFICATION

| | |
|-------------------------------|-------------------------------------|
| Accuracy | 0.028 mm (2 σ) ⁷ |
| Point Acquisition Rate | 752 000 points/s |
| Points per Line | Max. 7520 |
| Line Rate | Max. 100 Hz |
| Line Width (mid) | 115 mm |
| Standoff | 165 ± 50 mm |
| Minimum Point Spacing | 0.011 mm |
| System Scanning Certification | yes |
| Laser Class | 2M |
| Operating Temperature | 5–40°C |
| Weight | 0.4 kg |

ABSOLUTE ARM 6-AXIS ACCURACY AND SIZE SPECIFICATION

| | Model | E_{UNI}^1 | P_{SIZE}^2 | L_{DIA}^3 | P_{FORM}^4 | Weight | Max. reach |
|-----------|--------|-------------|--------------|-------------|--------------|---------|------------|
| 83 series | 8312-6 | 0.024 mm | 0.010 mm | 0.021 mm | 0.018 mm | 12.0 kg | 1.49 m |
| | 8320-6 | 0.040 mm | 0.013 mm | 0.042 mm | 0.026 mm | 7.8 kg | 2.23 m |
| | 8325-6 | 0.046 mm | 0.020 mm | 0.053 mm | 0.038 mm | 8.1 kg | 2.73 m |
| | 8330-6 | 0.067 mm | 0.029 mm | 0.071 mm | 0.054 mm | 8.4 kg | 3.23 m |
| | 8335-6 | 0.085 mm | 0.038 mm | 0.090 mm | 0.063 mm | 8.7 kg | 3.73 m |
| | 8340-6 | 0.100 mm | 0.046 mm | 0.105 mm | 0.077 mm | 9.0 kg | 4.23 m |
| | 8345-6 | 0.120 mm | 0.052 mm | 0.110 mm | 0.086 mm | 9.3 kg | 4.73 m |
| 85 series | 8512-6 | 0.019 mm | 0.006 mm | 0.016 mm | 0.012 mm | 12.2 kg | 1.49 m |
| | 8520-6 | 0.023 mm | 0.008 mm | 0.030 mm | 0.017 mm | 8.0 kg | 2.23 m |
| | 8525-6 | 0.028 mm | 0.010 mm | 0.035 mm | 0.020 mm | 8.3 kg | 2.73 m |
| | 8530-6 | 0.042 mm | 0.015 mm | 0.053 mm | 0.030 mm | 8.6 kg | 3.23 m |
| | 8535-6 | 0.055 mm | 0.020 mm | 0.069 mm | 0.040 mm | 8.9 kg | 3.73 m |
| | 8540-6 | 0.067 mm | 0.024 mm | 0.085 mm | 0.045 mm | 9.2 kg | 4.23 m |
| | 8545-6 | 0.080 mm | 0.028 mm | 0.102 mm | 0.050 mm | 9.5 kg | 4.73 m |
| 87 series | 8725-6 | 0.026 mm | 0.009 mm | 0.032 mm | 0.018 mm | 8.3 kg | 2.73 m |
| | 8730-6 | 0.039 mm | 0.014 mm | 0.048 mm | 0.028 mm | 8.6 kg | 3.23 m |
| | 8735-6 | 0.052 mm | 0.018 mm | 0.064 mm | 0.037 mm | 8.9 kg | 3.73 m |
| | 8740-6 | 0.063 mm | 0.022 mm | 0.079 mm | 0.041 mm | 9.2 kg | 4.23 m |
| | 8745-6 | 0.074 mm | 0.026 mm | 0.094 mm | 0.046 mm | 9.5 kg | 4.73 m |

 ABSOLUTE ARM COMPACT
 10360-2 ACCURACY SPECIFICATION

| Model | MPE_p^8 | MPE_e^9 |
|-------|-----------|------------------|
| 8312 | 0.008 mm | 5+L/40 <0.018 mm |
| 8512 | 0.006 mm | 5+L/65 <0.015 mm |

ABSOLUTE ARM TECHNICAL SPECIFICATION

| | |
|-----------------------|-----------------------|
| Operating Temperature | +5° to +40°C |
| Storage Temperature | -30° to +70°C |
| Operational Elevation | 2000 m |
| Relative Humidity | 10–90% non-condensing |
| Marks of Conformity | CE – FCC – IC |
| Power Requirement | 110–240 V |

¹ E_{UNI} Maximum permissible longitudinal error of measurement – according to ISO 10360-12:2016

² P_{SIZE} Maximum permissible probe deviation, size – according to ISO 10360-12:2016

³ P_{FORM} Maximum permissible probe deviation, shape – according to ISO 10360-12:2016

⁴ L_{DIA} Maximum permissible probe deviation, position – according to ISO 10360-12:2016

⁵SSA Scanning System Accuracy: L_{DIA} according to ISO 10360-8 Annex D

⁶Weight Weight without scanner

⁷Accuracy According to ISO 10360-8:2013

⁸ MPE_p Maximum permissible error, probing – according to ISO 10360-2

⁹ MPE_e Maximum permissible error, length measurement – according to ISO 10360-2

Hexagon Manufacturing Intelligence helps industrial manufacturers develop the disruptive technologies of today and the life-changing products of tomorrow. As a leading metrology and manufacturing solution specialist, our expertise in sensing, thinking and acting – the collection, analysis and active use of measurement data – gives our customers the confidence to increase production speed and accelerate productivity while enhancing product quality.

Through a network of local service centres, production facilities and commercial operations across five continents, we are shaping smart change in manufacturing to build a world where quality drives productivity. For more information, visit [HexagonMI.com](https://www.hexagonmi.com).

Hexagon Manufacturing Intelligence is part of Hexagon (Nasdaq Stockholm: HEXA B; [hexagon.com](https://www.hexagon.com)), a leading global provider of information technologies that drive quality and productivity across geospatial and industrial enterprise applications.

-  COORDINATE MEASURING MACHINES
-  3D LASER SCANNING
-  SENSORS
-  PORTABLE MEASURING ARMS
-  SERVICES
-  LASER TRACKERS & STATIONS
-  MULTISENSOR & OPTICAL SYSTEMS
-  WHITE LIGHT SCANNERS
-  METROLOGY SOFTWARE SOLUTIONS
-  CAD / CAM
-  STATISTICAL PROCESS CONTROL
-  AUTOMATED APPLICATIONS
-  MICROMETERS, CALIPERS AND GAUGES
-  DESIGN AND COSTING SOFTWARE