



IRREPROACHABLE 3D MEASUREMENTS





ACE MEASURING ARM RANGE

PRECISELY FOR YOU

Thanks to innovative technology and state-of-the-art manufacturing, Kreon® measuring arms from the ACE range offer advanced 3D measuring solutions for both scanning and probing.

Compliant with the latest ISO standards and compatible with leading software available on the market, they meet increasingly stringent demands in terms of precision and productivity.

The ACE range comprises two models: the ACE and the ACE+ measuring arm. Working with the latest encoder technology, the ACE+ arm also boasts an advanced calibration method, ensuring exceptional levels of performance.

Portable and exceptionally easy to use, measuring arms from the ACE range have their place in any working environment – workshops, measuring labs, outdoor sites – and in a wide range of high-tech industries, such as automotive and aeronautics.

7 AXES AND 6 AXES

Kreon ACE measuring arms are available in 6-axis and 7-axis versions. Each offers benefits for specific applications.

6-AXIS VERSION FOR PROBING

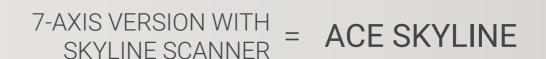
- ▶ Perfect for applications requiring highly accurate probing
- At identical sizes, greater accuracy with 6 axes as compared to 7
- ▶ The compact ergonomics of the arm-end improves the access for the narrow measurement
- ▶ Compatible with Kreon 3D scanners (Zephyr and Solano ranges)



7-AXIS VERSION FOR SCANNING

- An additional axis and a joint enhance ergonomics when scanning
- Integration of the Skyline 3D scanners range
- ▶ Easy switchover from scanning to probing
- ▶ Both scanning and probing within the same measuring range
- Scanning precision up to 45 μm









EXCELLENCE IN EVERY DETAIL

Efficient, lightweight and accurate, KREON ACE arms are the ultimate solution for ensuring flawless production quality, whatever your application and the size of your company.

ACE arms fitted with the Skyline 3D scanners can digitise any part in the twinkling of an eye. Accurate and at high resolution, they capture the smallest details in the most complex parts. A Skyline scanner combined with an ACE arm offers an ergonomic system for effortless scanning.

SAVE MORE TIME

with a reliable, performant and easy to use system, at an incredible acquisition speed.

SCAN ANY PART

dark or clear, dull or shiny, big or small or all at once. Its freedom of movement enables an access to internal or back side of difficult or closed volumes.

SCAN ANYWHERE

in a metrology room, a workshop, on a machine tool or even outside, due to temperature compensation

CONTROL WITH CONFIDENCE

the freeform parts with the extreme accuracy of Skyline scanner and the geometrical elements with the probe integrated under the scanner.



SKYLINE SCANNERS: SPEED AND ACCURACY

Skyline scanners use state-of-the-art technologies developed by KREON for nearly 30 years. Apart from leading technical capabilities, they are highly reliable, compact and adapt to almost any working environment.

Based on a single technology platform, Skyline 3D scanners are available in three models: Skyline **Eyes**, **Wide** and **Open**.

ADVANCED SCANNING SPEED 200mm* laser line

- Decreased number of scan passes on the part given to max 200 mm laser line*
- ▶ Faster movement of the 3D scanner assured by the increased frequency
- ▶ Acquisition speed of 600,000 points/sec, allowing to quickly get the dense point cloud*
- ▶ Ergonomic "push and pull" handle, providing a fabulous scanning efficiency

HIGH RESOLUTION 25µm* AND HIGH ACCURACY 9µm*

- ▶ 2,000 points per laser line for a high resolution level*
- ▶ Optimal accuracy, even on shiny reflective surfaces, due to blue laser fineness
- > Temperature compensation of the 3D scanner to avoid pre-heating and to maintain a constant accuracy

EASE OF USE

- > Scan longer owing to the 3D scanner lightness (weight less than 400 g)
- ▶ Reach and scan the hard-to-access zones of each part, thanks to compactness
- Visualize precisely the ideal scanning distance with the LED indicator
- ▶ Remove the scanner rapidly and without any tool to accelerate the probe mounting

Software used for probing and scanning:
Polyworks, Metrolog, Geomagic, PowerInspect, Capps, etc

^{*}maximum values depending on the Skyline scanner model





Find out specifications at the next page

To better capture reality, keep "EYES WIDE OPEN"

SKYLINE **EYES**

THE MOST ACCURATE



catches the eye on the most challenging parts and applications

SKYLINE **WIDE**

THE FASTEST



is wide-awake to scan large surfaces at high speed

SKYLINE OPEN

THE MOST AFFORDABLE



is open to any kind of project and application

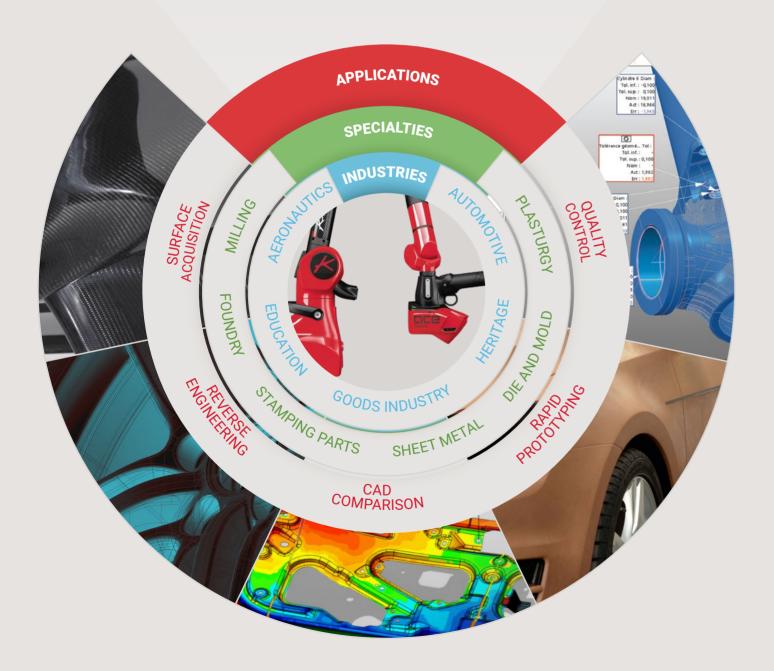
SKYLINE SPECIFICATIONS

	EYES	WIDE	OPEN
Max scanning speed	600.000 pts/sec	600.000 pts/sec	200.000 pts/sec
MPE (P[Size.Sph.All:Tr:ODS]) (2σ) *1	9 μm	15 μm	15 μm
MPL (P[Form.Sph.D95%:Tr:ODS]) (2σ) *2	15 μm	17 μm	20 μm
MPL (P[Form.Pla.D95%:Tr:ODS]) (2σ) *3	18 μm	22 μm	25 μm
Max laser line width	100 mm	200 mm	100 mm
Max frequency	300 Hz	300 Hz	200 Hz
Laser line color	Blue	Blue	Blue
Line resolution	25 μm	50 μm	50 μm
Stand-off distance	90 mm	85 mm	85 mm
Field of view	80 mm	110 mm	110 mm
Led indicators	Yes	Yes	No
Temperature compensation	Yes	Yes	No

APPLICATIONS

Kreon fulfills the needs and expectations of demanding customers regarding quality control, 3D measurement, deviation viewing, providing highly effective measurement solutions since many years.

ACE Skyline optimizes all your 3D measurement processes



TESTIMONIALS

Our customers choose ACE arms because...



Ryan Chapman, Head Metrologist at Mann Hummel:

"We never imagined that the ACE arm with its scanner would increase our productivity, inspection quality and profitability so significantly."



Michele Rausse, Head of Technical Department at IMarc:

"The ACE arm is a high-performance, versatile piece of equipment that meets all our measurement needs. Hard to see how we ever got by without it!"



Levi Meyer, Head Metrologist Herman Miller:

"The ACE Skyline arm, initially acquired for inspecting tubes, has come into its own in other applications too."



Marco Magnifico, Aerospace Engineer at Eurotech:

"Sometimes we use the Kreon measuring arm non-stop for a whole week. During these peak periods, we know we can count on its reliability."



 ${\it Fabio\ Panarelli,\ Quality\ Inspector\ at\ Composite ch:}$

"The speed and ease of use of the ACE Skyline arm have allowed us to significantly increase our productivity across the inspection phases."

SPECIFICATIONS

ACE MEASURING ARM

	Arm model	Working volume	E _{UNI} *	P _{SIZE} *	P _{FORM} *	L _{DIA} *	SPAT*
	Ace-7-20	2 m	0.033 mm	0.012 mm	0.020 mm	0.043 mm	0.022 mm
	Ace-7-25	2.5 m	0.036 mm	0.015 mm	0.024 mm	0.049 mm	0.027 mm
	Ace-7-30	3 m	0.059 mm	0.020 mm	0.035 mm	0.081 mm	0.042 mm
X X	Ace-7-35	3.5 m	0.069 mm	0.024 mm	0.041 mm	0.095 mm	0.054 mm
	Ace-7-40	4 m	0.083 mm	0.029 mm	0.048 mm	0.115 mm	0.066 mm
1 ~	Ace-7-45	4.5 m	0.112 mm	0.045 mm	0.060 mm	0.125 mm	0.078 mm
	Ace-7-50	5 m	0.140 mm	0.060 mm	0.075 mm	0.135 mm	0.095 mm
	Ace-6-20	2 m	0.029 mm	0.010 mm	0.016 mm	0.033 mm	0.020 mm
	Ace-6-25	2.5 m	0.032 mm	0.012 mm	0.019 mm	0.038 mm	0.025 mm
	Ace-6-30	3 m	0.044 mm	0.018 mm	0.028 mm	0.053 mm	0.033 mm
X	Ace-6-35	3.5 m	0.056 mm	0.021 mm	0.037 mm	0.068 mm	0.042 mm
1	Ace-6-40	4 m	0.067 mm	0.025 mm	0.043 mm	0.086 mm	0.051 mm
	Ace-6-45	4.5 m	0.080 mm	0.029 mm	0.048 mm	0.100 mm	0.069 mm
	Ace-6-50	5 m	0.120 mm	0.040 mm	0.060 mm	0.120 mm	0.090 mm

ACE+ MEASURING ARM

	Arm model	Working volume	E _{UNI} *	P _{SIZE} *	P _{FORM} *	L _{DIA} *	SPAT*
	Ace+7-25	2.5 m	0.029 mm	0.012 mm	0.022 mm	0.045 mm	0.025 mm
\mathcal{O}	Ace+7-30	3 m	0.052 mm	0.017 mm	0.030 mm	0.074 mm	0.039 mm
×	Ace+7-35	3.5 m	0.063 mm	0.021 mm	0.037 mm	0.089 mm	0.045 mm
XX	Ace+7-40	4 m	0.076 mm	0.026 mm	0.042 mm	0.105 mm	0.054 mm
	Ace+7-45	4.5 m	0.103 mm	0.040 mm	0.051 mm	0.114 mm	0.067 mm
6.0	Ace+6-25	2.5 m	0.026 mm	0.009mm	0.017 mm	0.037 mm	0.021 mm
(/) []]	Ace+6-30	3 m	0.039 mm	0.014 mm	0.024 mm	0.047 mm	0.030 mm
$\overline{}$	Ace+6-35	3.5 m	0.052 mm	0.017 mm	0.031 mm	0.063 mm	0.036 mm
<	Ace+6-40	4 m	0.063 mm	0.022 mm	0.038 mm	0.080 mm	0.044 mm
0	Ace+6-45	4.5 m	0.073 mm	0.025 mm	0.043 mm	0.093 mm	0.059 mm

^{*}All specifications are subject to change without notification

ACE MEASURING ARM WITH SKYLINE SCANNERS

		ACE			ACE+	
Arm model	Skyline Eyes L _{DIA scanning*}	Skyline Wide L _{DIA} scanning*	Skyline Open L _{DIA scanning} *	Skyline Eyes L _{DIA} scanning*	Skyline Wide L _{DIA} scanning*	Skyline Open L _{DIA scanning} *
Ace-7-20	0.040 mm	0.044 mm	0.046 mm			
Ace-7-25	0.046 mm	0.050 mm	0.052 mm	0.042 mm	0.046 mm	0.049 mm
Ace-7-30	0.061 mm	0.063 mm	0.065 mm	0.052 mm	0.056 mm	0.059 mm
Ace-7-35	0.076 mm	0.079 mm	0.081 mm	0.066 mm	0.071 mm	0.073 mm
Ace-7-40	0.088 mm	0.099 mm	0.102 mm	0.077 mm	0.081 mm	0.084 mm
Ace-7-45	0.120 mm	0.130 mm	0.132 mm	0.095 mm	0.104 mm	0.110 mm
Ace-7-50	0.140 mm	0.155 mm	0.160 mm			

Operating temperature range: 10-45 °C Power supply: universal worldwide voltage 100-250V Humidity: 95%, non condensing IP51





ACE ARMS ARE COMPLIANT WITH ISO 10360-12

According to ISO 10360-12, 2016:

EUNI (EUni:0:Tact.AArm): Unidirectional distance error between two probed points in the arm volume PSIZE (PSize.Sph.1x25:Tact.AArm): Error on the measurement of a sphere diameter by probing PFORM (PForm.Sph.1x25::Tact.AArm) : Dispersion value in measurement of a sphere radius by probing LDIA (LDia.5x5:Art:Tact.AArm): Errors due to arm articulations, mainly axes 5, 6 and 7 of the wrist, measured with probe SPAT: Measurement error when the probe is stationary and the arm elbow moves from left to right

SKYLINE SCANNERS ARE COMPLIANT WITH ISO 10360-8

According to ISO 10360-8:2013:

LDIA scanning (LDia:j:ODS): Errors due to arm articulations, mainly axes 5, 6 and 7 of the wrist, measured with scanner

- *1 MPE (P[Size.Sph.All:Tr:ODS]): Error on the measurement of a sphere diameter by Scanning
- *2 MPL (P[Form.Sph.D95%:Tr:ODS]): dispersion value on 95% of the measured points on a sphere *3 MPL (P[Form.Pla.D95%:Tr:ODS]): dispersion value on 95% of the measured points on a plan



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THE MOST ACCURATE KREON MEASURING ARM

The Kreon Onyx measuring arm is the epitome of high performance. It guarantees 3D measurements of parts and tools with an unprecedented level of accuracy.

Quality assurance

The use of high resolution encoders gives it the highest accuracy of all Kreon measuring arms. The presence of numerous carbon fiber structural parts makes the arm considerably lighter, which improves the user experience. Finally, the simplified and more rigid assembly of the Onyx arm makes it extremely reliable and durable, for flawless measurement results, even in the most challenging environments.

Meets all 3D measurement needs

Being versatile, Onyx arms are able to measure by probing or by scanning. They are equally suitable for use in a measuring lab or workshop and for all applications (quality control, reverse engineering, etc.). Thus, they will be a welcome addition across all industries (automotive, aerospace, etc.). Its light weight and ergonomic design provide an unparalleled ease of use and productivity.

Productivity
Flexibility
Reliability
Trust
Simplicity



BETTER ERGONOMICS FOR GREATER PRODUCTIVITY

Lightness and comfort

Onyx allows any user to work for hours with no effort, owing to its light handling and flexible counterbalancing.

Users particularly appreciate Kreon's internal counterbalancing that provides the perfect balance between firmness and flexibility. A lighter arm makes the use even more comfortable.

Ikg
Weight in your hand

9 kg
Full weight of the arm*
*Depending on the arm size



simply by pressing the unlock button.

Tool-free mounting of scanners and probes Repeatability of the Renishaw interface The handle of the Onyx 7-axis arm can be removed to allow measurement in cavities and areas that would otherwise be inaccessible. The handle is attached and removed.

Ergonomy and simplicity

Thanks to the ease and simplicity of use of the Onyx arm, beginner users are quickly operational.



Infinite rotation axes

Infinite rotation axes offer immense freedom of movement for users and allow measurements in cavities and areas that would otherwise be inaccessible.



Fast mounting of the most appropriate configuration for scanning or probing

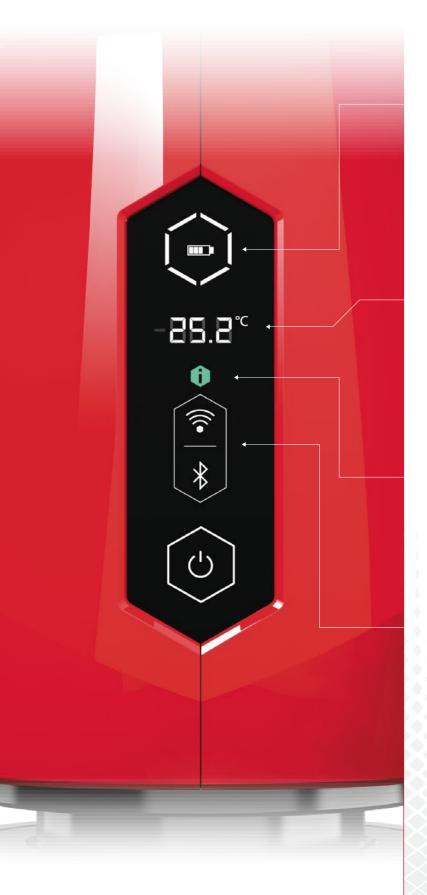
You can choose the best acquisition method according to the type of parts. At any time, and without recalibration, simply switching from probing to scanning.

The probing mode is more suitable for dimensional inspection of precise small geometric areas. The scanning mode is more suitable for the general shape of the part. And all of that without workflow interruption.

Comfort Lightness Handling Speed

NEW QUICKVIEW SCREEN

Clear visualisation and easy control of the main arm settings.



Battery charge



- ▶ Probing autonomy: 8 hours
- ▶ Scanning autonomy: 4 hours
- Batteries can be changed without stopping the measuring arm

| Ambient temperature

25.2

- ► Prevent use outside normal operating temperatures (10-45°C)
- ► Compensate for the expansion of parts during significant temperature variations

Arm status



► Check that the arm is 100% operational or detect potential anomalies

Wifi and Bluetooth





• Easily use the arm far away from the computer thanks to the integrated wireless connection.

A 6-AXIS VERSION FOR GREATER ACCURACY

The Onyx measuring arm is also available in a 6-axis version for probing use. It is mainly intended for measuring demanding geometric entities and even more accurate than the 7-axis version.







Exceptional accuracy

The 6-axis version of the Onyx arm is is up to 20% more accurate than the 7-axis version. It is the most accurate in the Kreon range.



Freedom of movement

6th axis is extremely mobile with an impressive 360° range. It can easily reach the underside of certain assemblies or the inside of rabbets.



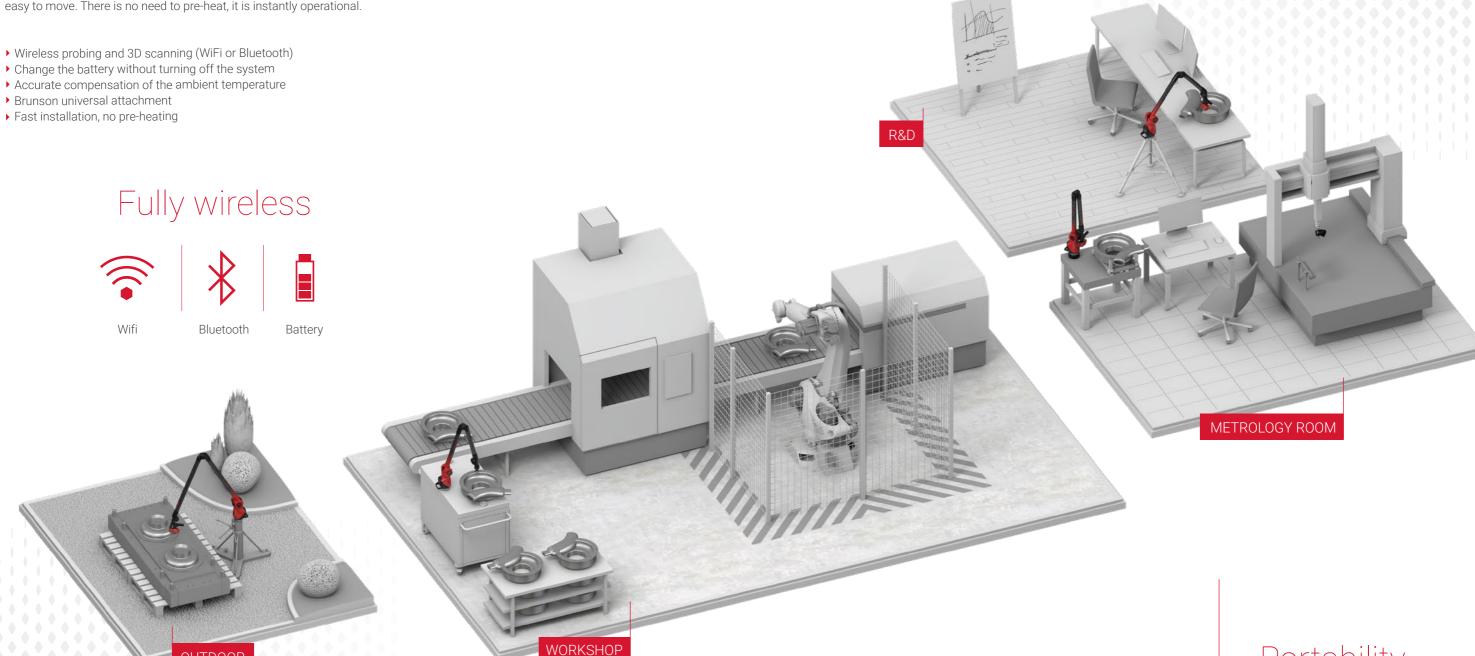
Probing difficult-to-access areas

The interior of certain parts, impossible to measure with tracked tools, can easily be reached with the fineness of the arm's ending.

AN ULTRA PORTABLE SYSTEM

The Onyx measuring arm can be installed as close as possible to the application. Workshop, measuring lab or even outdoors, the arm can be used in the most extreme environments while maintaining measurement quality.

Fully wireless, lightweight and delivered with a transport case, the system is very easy to move. There is no need to pre-heat, it is instantly operational.



Portability Reliability Adaptability Lightness

SKYLINE SCANNERS: SPEED AND ACCURACY

Skyline scanners use state-of-the-art technologies developed by KREON for nearly 30 years. Apart from leading technical capabilities, they are highly reliable, compact and adapt to almost any working environment.

Based on a single technology platform, Skyline 3D scanners are available in three models: Skyline **Eyes**, **Wide** and **Open**.

SKYLINE **EYES**

The most accurate



is suited for the most challenging parts and applications

Speed
Resolution
Accuracy



SKYLINE WIDE

The fastest



is wide-awake to scan large surfaces at high speed



SKYLINE OPEN

The most affordable



is open to any kind of project and application







Quality
Control
Accuracy
Performance

Advanced scanning speed: **200mm* laser line**

- Less scan passes with 200mm laser line*
- ► Faster movement of the 3D scanner assured by the increased frequency
- Acquisition speed of 600,000 points/sec, allowing to quickly get the dense point cloud*

High resolution: 25 μm* High accuracy: 9 μm*

- ▶ 2,000 points per laser line for a high resolution level*
- Optimal accuracy, even on shiny reflective surfaces, due to blue laser fineness
- ▶ Temperature compensation of the 3D scanner to avoid pre-heating and to maintain a constant accuracy

Easy of use

- Scan longer owing to the 3D scanner lightness (less than 400 g)
- Reach and scan the hard-to-access zones of each part, thanks to compactness
- Visualize precisely the ideal scanning distance with the LED indicators
- Remove the scanner rapidly and without any tool to accelerate the probe mounting

Software used for probing and scanning: Zenith, Polyworks, Metrolog, Geomagic, PowerInspect, Capps, etc

*maximum values depending on the Skyline scanner model Technical specifications at the end of the documentation

APPLICATIONS

Kreon fulfills the needs and expectations of demanding customers regarding quality control, 3D measurement, deviation viewing, by providing highly effective measurement solutions for many years.

Always the best 3D acquisitions with the Onyx measuring arm

Applications

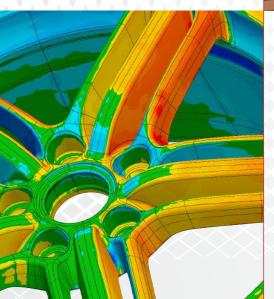
Quality control Rapid prototyping CAD comparison Reverse engineering Surface acquisition





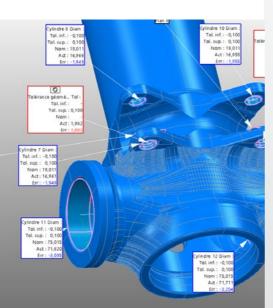
Specialities

Plasturgy Die and mold Sheet metal Stamping parts Foundry Milling



Industries

Automotive Aeronautics Goods industry Education Heritage



ZENITH SOFTWARE: EASILY MANAGE SCANNING AND PROBING

Zenith focuses on the essential functions used in most applications for acquisition and 3D measurement of industrial parts. Simple to learn, and free*, but able to manage dense point clouds and color mapping, this is Zenith.

Connection with Kreon hardware

Probing

- ▶ Acquisition of geometrical entities
- ▶ Measure and deviation

3D scanning

- ▶ Fast point cloud acquisition
- ▶ Extraction from CAD
- ▶ Color mapping

| Automatic report generation

* Zenith is provided for free with the purchase of a Kreon arm.



ACCESSORIES

Kreon offers a wide range of accessories for adapting the configuration of the measuring arm to the application and the working environment: specific probes, mounting bases, tripods, leapfrog kit.

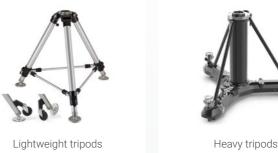






Bases

Leapfrog kits





Rolling carts

TECHNICAL SPECIFICATIONS

Onyx measuring arms

	Arm model	Working volume	E _{UNI} *	P _{SIZE} *	P _{FORM} *	L _{DIA} *	SPAT*
	Onyx-7-20	2 m	0.025 mm	0.010 mm	0.018 mm	0.040 mm	0.020 mm
	Onyx-7-25	2.5 m	0.028 mm	0.011 mm	0.021 mm	0.044 mm	0.023 mm
<u>(/)</u>	Onyx-7-30	3 m	0.050 mm	0.016 mm	0.028 mm	0.072 mm	0.035 mm
N N N	Onyx-7-35	3.5 m	0.061 mm	0.020 mm	0.035 mm	0.087 mm	0.043 mm
	Onyx-7-40	4 m	0.074 mm	0.025 mm	0.040 mm	0.102 mm	0.052 mm
·	Onyx-7-45	4.5 m	0.100 mm	0.038 mm	0.049 mm	0.110 mm	0.065 mm
	Onyx-7-50	5 m	0.120 mm	0.052 mm	0.062 mm	0.125 mm	0.089 mm
	Onyx-6-20	2 m	0.024 mm	0.007 mm	0.015 mm	0.030 mm	0.017 mm
	Onyx-6-25	2.5 m	0.026 mm	0.008 mm	0.016 mm	0.032 mm	0.019 mm
AX S	Onyx-6-30	3 m	0.038 mm	0.012 mm	0.022 mm	0.046 mm	0.028 mm
\times	Onyx-6-35	3.5 m	0.051 mm	0.015 mm	0.030 mm	0.062 mm	0.035 mm
9	Onyx-6-40	4 m	0.062 mm	0.020 mm	0.036 mm	0.078 mm	0.042 mm
_	Onyx-6-45	4.5 m	0.072 mm	0.024 mm	0.041 mm	0.090 mm	0.057 mm
	Onyx-6-50	5 m	0.110 mm	0.038 mm	0.058 mm	0.110 mm	0.080 mm

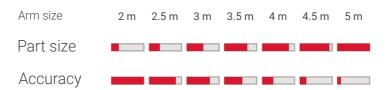
Skyline specifications

	EYES	WIDE	OPEN
Max scanning speed	600.000 pts/sec	600.000 pts/sec	200.000 pts/sec
MPE (P[Size.Sph.All:Tr:ODS]) (2σ) *1	9 μm	15 μm	15 μm
MPL (P[Form.Sph.D95%:Tr:ODS]) (2σ) *2	15 µm	17 μm	20 μm
MPL (P[Form.Pla.D95%:Tr:ODS]) (2σ) *3	18 µm	22 μm	25 µm
Max laser line width	100 mm	200 mm	100 mm
Max frequency	300 Hz	300 Hz	200 Hz
Laser line color	2M Blue	2M Blue	2M Blue
Line resolution	25 µm	50 μm	50 μm
Stand-off distance	90 mm	85 mm	85 mm
Field of view	80 mm	110 mm	110 mm
LED indicators	Yes	Yes	No
Temperature compensation	Yes	Yes	No

Onyx measuring arms with Skyline scanners

		ONYX	
Arm model	Skyline Eyes L _{DIA scanning} *	Skyline Wide L _{DIA scanning} *	Skyline Open L _{DIA scanning*}
Onyx-7-20	0.038 mm	0.042 mm	0.044 mm
Onyx-7-25	0.040 mm	0.044 mm	0.047 mm
Onyx-7-30	0.050 mm	0.055 mm	0.057 mm
Onyx-7-35	0.064 mm	0.069 mm	0.072 mm
Onyx-7-40	0.075 mm	0.079 mm	0.082 mm
Onyx-7-45	0.093 mm	0.102 mm	0.109 mm
Onyx-7-50	0.120 mm	0.130 mm	0.140 mm

Operating temperature range: 10-45 °C Power supply: universal worldwide voltage 100-250V Humidity: 95%, non condensing IP51





Onyx arms comply with ISO 10360-12

According to ISO 10360-12, 2016:

EUNI (EUni:0:Tact.AArm)

Unidirectional distance error between two probed points in the arm volume

PSIZE (PSize.Sph.1x25:Tact.AArm)

Error on the measurement of a sphere diameter by

PFORM (PForm.Sph.1x25::Tact.AArm)

Dispersion value in measurement of a sphere radius by probing

LDIA (LDia.5x5:Art:Tact.AArm)

Errors due to arm articulations, mainly axes 5, 6 and 7 of the wrist, measured with probe

Measurement error when the probe is stationary and the arm elbow moves from left to right

Skyline scanners comply with ISO 10360-8

According to ISO 10360-8:2013:

LDIA scanning (LDia:j:ODS)

Errors due to arm articulations, mainly axes 5, 6 and 7 of the wrist, measured with scanner

*1 MPE (P[Size.Sph.All:Tr:ODS])

on a sphere

Error on the measurement of a sphere diameter by Scanning

*2 MPL (P[Form.Sph.D95%:Tr:ODS]) Dispersion value on 95% of the measured points

*3 MPL (P[Form.Pla.D95%:Tr:ODS])

Dispersion value on 95% of the measured points on a plan



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