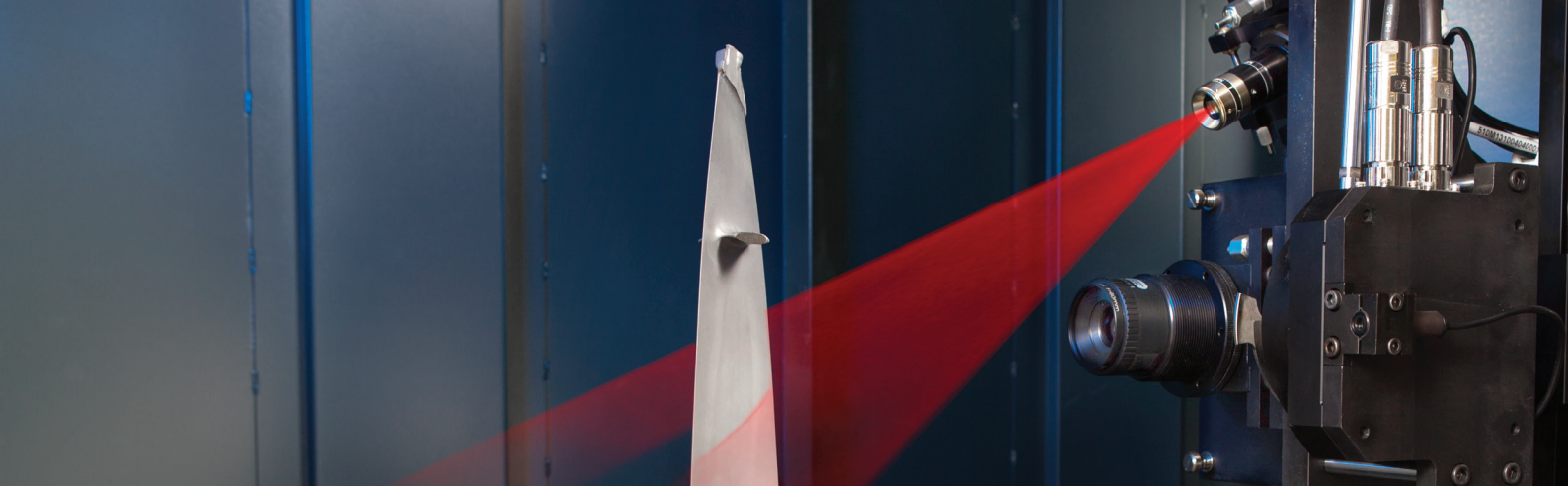




BLAZER™

JET & POWER BLADES

MEASURING MACHINES CATALOG



BLAZER™

The fastest high-performance non-contact, automatic measuring machine, specially designed for measuring jet engine and power turbine blades geometric parameters. Best solution for the production floor.

BLAZER BENEFITS

- Higher increase in blade inspection throughput compared to any other known technology
- High accuracy
- Best price/performance
- Low operating cost
- Enables quality control at all production stages
- Easy setup and programming
- User-friendly interface
- High versatility
- Detailed graphical reports
- High protection from external influences

BLAZER CONFIGURATIONS

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THE COMPANY

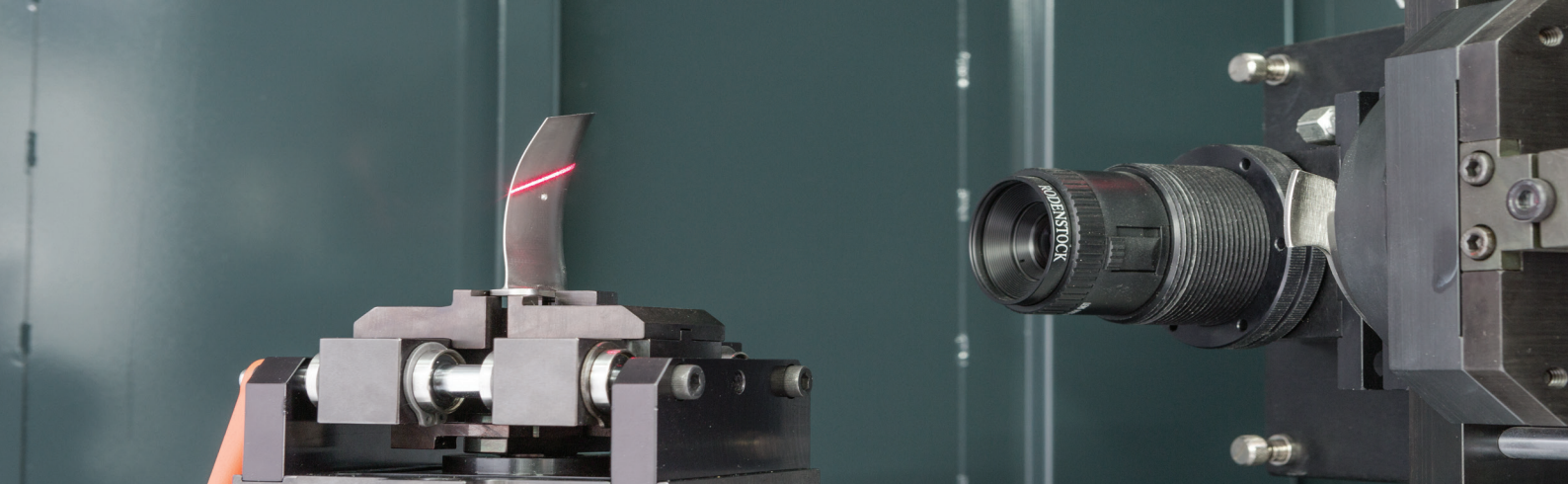
Metroptic Technologies Ltd., was founded in 1997.

The company belongs to the IMC group of companies (<http://www.imc-companies.com/>).

Metroptic provides innovative non-contact sensor technologies and products for a variety of industries.

Metroptic Technologies Ltd. is a proud partner of leading companies in the metrology and aviation industries.





BLAZER 2S

Small to Medium Blade Inspection

Optical measuring machine designed to inspect small and medium size blades. It is capable of measuring all blade parameters including airfoil (incl. edge shape), root and platforms. BLAZER 2S has a very fine resolution (about 80 pts/mm of section profile) and, therefore, is capable of measuring blades with a very sharp edge (as small as 0.035 mm radius).



Basic Parameters of Measured Object:

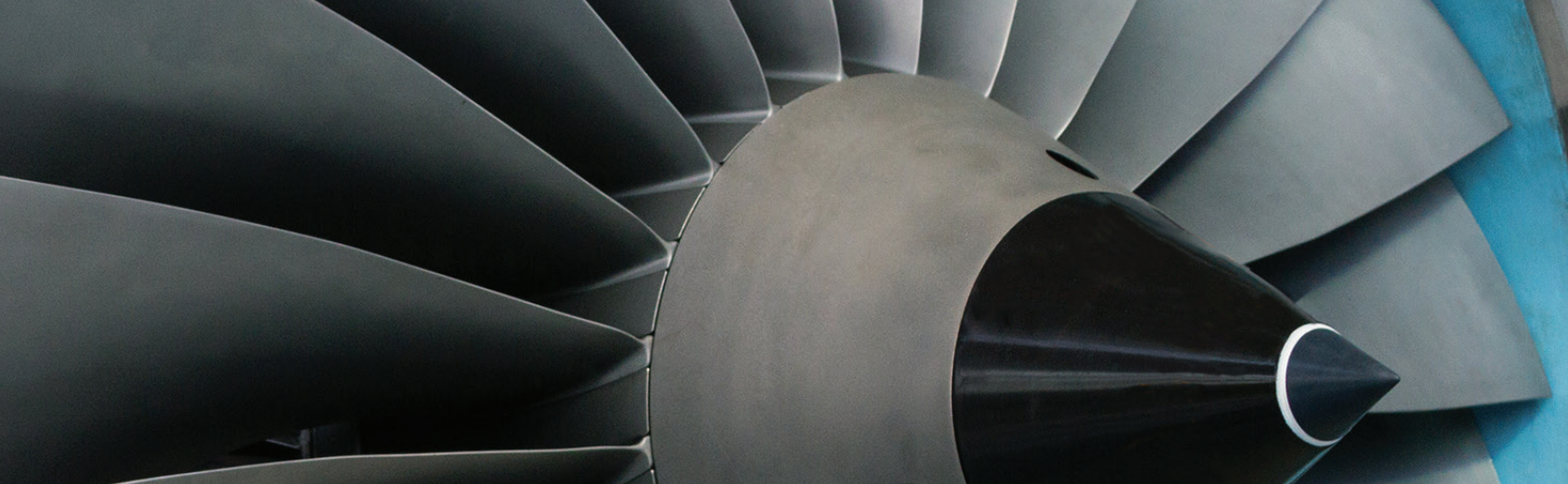
Total height	up to 450 mm
Chord width	up to 140 mm
Minimum edge radius	35 μ m
Maximum weight (including fixture)	15 kg



KEY TECHNICAL CHARACTERISTICS

Parameter	BLAZER 2S
Dedication	Final or intermediate inspection of whole scope of blade parameters
Maximum blade height (incl. fixture/goniometer)	450 mm
Maximum blade chord	140 mm
Maximum load on rotary surface	15 kg
Lateral resolution	80 pts/mm
Minimum edge radius (for edge shape inspection)	0.035 mm
Measuring accuracy (of single point@3 σ)	± 0.008 mm
BLAZER 2S Blade parameter measuring accuracy:	
Thicknesses	± 0.015 mm
Edge profile shape	± 0.010 mm
Chord length	± 0.015 mm
Airfoil profile	± 0.010 mm
Platform	± 0.015 mm
Typical airfoil inspection time:	
Small blade, 100 mm height, 25 mm chord, 6 sections	60 sec
Medium blade, 250 mm height, 80 mm chord, 10 sections	120 sec
Medium blade, 250 mm height, 80 mm chord, 10 sections (after forging - no edges)	80 sec

BLAZER 2S dimensions:	
Length	800 mm
Width	1400 mm
Height	1700 mm
Weight	700 kg
Power supply:	
Voltage	110 V / 220 V
Power	600 VA



BLAZER 2M

MEDIUM TO BIG BLADE INSPECTION

Mid-size optical measuring machine covering a wide range of blades from small to large. It is capable of measuring all blade parameters (the same as BLAZER 25). Additionally, BLAZER 2M is equipped with a goniometer capable of measuring blade clusters.



Basic Parameters of Measured Object:

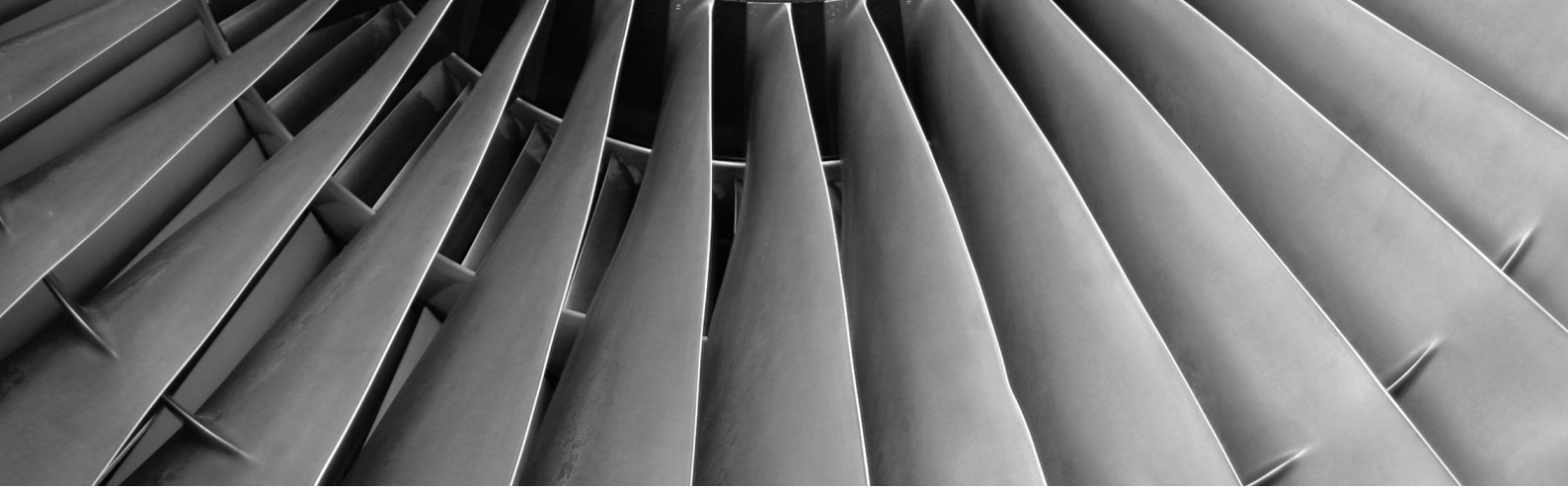
Basic Parameters of Measured Object:	
Total height	up to 800 mm
Chord width	up to 400 mm
Minimum edge radius	65 μ m
Maximum weight (Including fixture)	200 kg



KEY TECHNICAL CHARACTERISTICS

Parameter	BLAZER 2M
Dedication	Final or intermediate inspection of whole scope of blade parameters
Maximum blade height (incl. fixture/goniometer)	800 mm
Maximum blade chord	400 mm
Maximum load on rotary surface	250 kg
Lateral resolution	40 pts/mm
Minimum edge radius (for edge shape inspection)	0.065 mm
Measuring accuracy (of single point@3σ)	±0.012 mm
BLAZER 2M Blade parameter measuring accuracy:	
Thicknesses	±0.025 mm
Edge profile shape	±0.015 mm
Chord length	±0.025 mm
Airfoil profile	±0.015 mm
Platform	±0.015 mm
Typical airfoil inspection time:	
Small blade, 100 mm height, 25 mm chord, 6 sections	60 sec
Medium blade, 250 mm height, 80 mm chord, 10 sections	120 sec
Medium blade, 250 mm height, 80 mm chord, 10 sections (after forging - no edges)	80 sec
Big blade, 600 mm height, 200 mm chord, 15 sections	300 sec

BLAZER 2M dimensions:	
Length	1400 mm
Width	2000 mm
Height	2100 mm
Weight	1400 kg
Power supply:	
Voltage	110 V / 220 V
Power	2500 VA



BLAZER 2M Blisk

MEDIUM INTEGRALLY BLADED ROTORS (IBR) INSPECTION

Designed to inspect small-size integrally bladed rotors (blisks/IBR). Capable of measuring all blade airfoil parameters and open flow areas.



Basic Parameters of Measured Object:

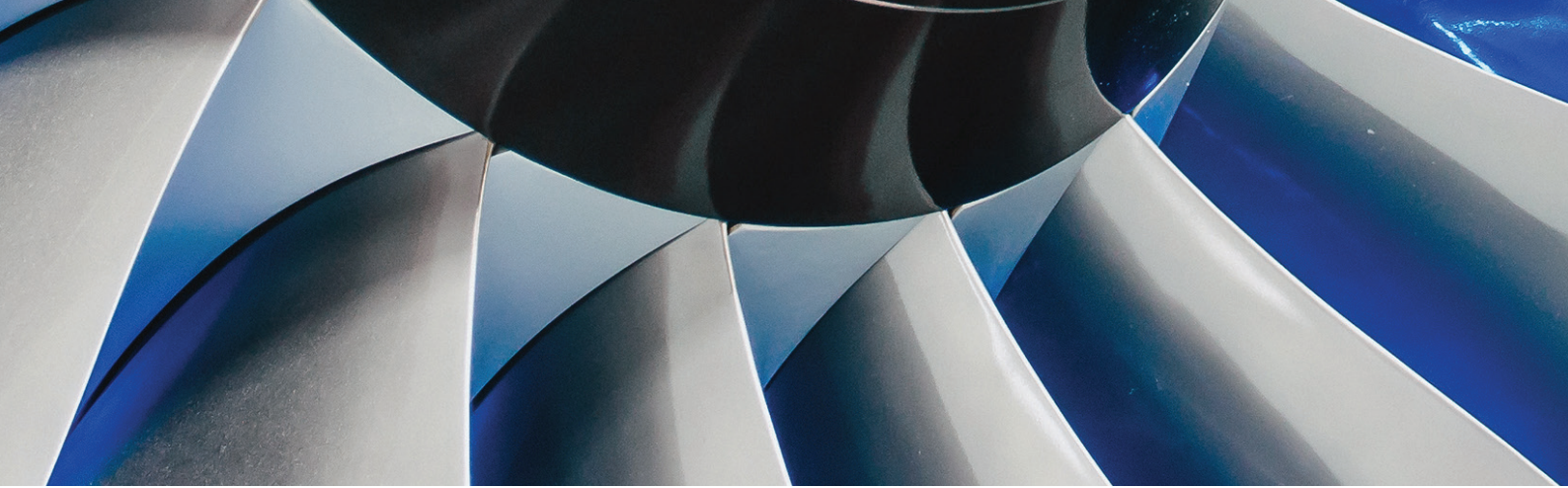
Basic Parameters of Measured Object:

Outer diameter	up to 700 mm
Blade chord	up to 150 mm
Minimum edge radius	90 μm
Maximum weight	100 kg



KEY TECHNICAL CHARACTERISTICS

Parameter	BLAZER 2M Blisk
Dedication	Final or intermediate inspection of IBR
Maximum outer diameter	700 mm
Maximum blade chord	150 mm
Maximum load on horizontal rotary surface	250 kg
Maximum load on vertical rotary axis	150 kg
Lateral resolution	33 pts/mm
Minimum edge radius (for edge shape inspection)	0.090 mm
Measuring accuracy (of single point @3 σ)	± 0.013 mm
BLAZER 2M Blisk Blade measuring accuracy:	
Thicknesses	± 0.025 mm
Edge profile shape	± 0.015 mm
Chord length	± 0.025 mm
Airfoil profile	± 0.015 mm
Typical inspection time:	
IBR, 600 mm diameter, 100 mm blade chord, 25 blades, 4 sections	25-30 min.
BLAZER 2M Blisk dimensions:	
Length	1400 mm
Width	2000 mm
Height	2100 mm
Weight	1600 kg
Power supply:	
Voltage	110 V / 220 V
Power	2500 VA

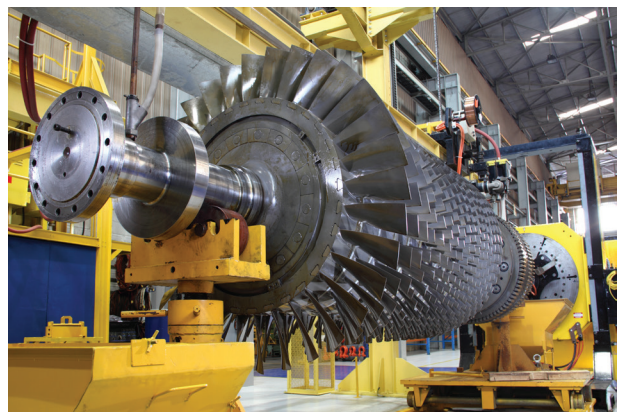


BLAZER 2L

LARGE BLADE INSPECTION



Large size optical measuring machine designed to inspect big blades. Capable of measuring all blade parameters including airfoil (incl. edge shape), root and platforms.



Basic Parameters of Measured Object:

Total height	up to 1800 mm
Chord width	up to 500 mm
Minimum edge radius	120 μm
Maximum weight (Including fixture)	250 kg

KEY TECHNICAL CHARACTERISTICS

Parameter	BLAZER 2L
Dedication	Final or intermediate inspection of whole scope of blade parameters
Maximum blade height (incl. fixture)	1800 mm
Maximum blade chord	500 mm
Maximum load on rotary surface	250 kg
Lateral resolution	25 pts/mm
Minimum edge radius (for edge shape inspection)	0.120 mm
Measuring accuracy (of single point @3 σ)	± 0.016 mm
BLAZER 2L Blade parameter measuring accuracy:	
Thicknesses	± 0.035 mm
Edge profile shape	± 0.025 mm
Chord length	± 0.035 mm
Airfoil profile	± 0.025 mm
Platform	± 0.025 mm
Typical airfoil inspection time:	
Big blade, 1500 mm height, 400 mm chord, 25 sections	500 sec
BLAZER 2L dimensions:	
Length	1800 mm
Width	2400 mm
Height	3200 mm
Weight	2500 kg
Power supply:	
Voltage	110 V / 220 V
Power	2500 VA



BLAZER 2L Blisk

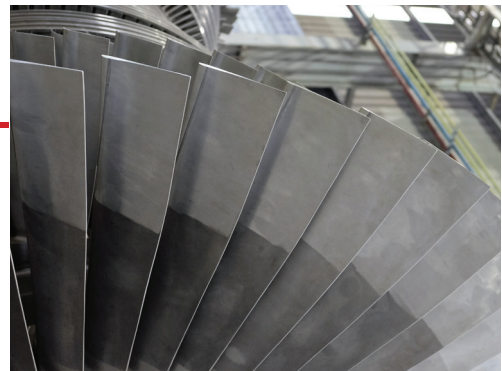
LARGE IBR INSPECTION

Optical measuring machine designed to inspect mid-size integrally bladed rotors (blisks/IBR). Capable of measuring all blade airfoil parameters and open flow areas.



Basic Parameters of Measured Object:

Blade chord	up to 200 mm
Minimum edge radius	120 μm
Maximum weight	100 kg



KEY TECHNICAL CHARACTERISTICS

Parameter	BLAZER 2L Blisk
Dedication	Final or intermediate inspection of IBR
Maximum outer diameter	1200 mm
Maximum blade chord	200 mm
Maximum load on horizontal rotary surface	250 kg
Maximum load on vertical rotary axis	150 kg
Lateral resolution	28 pts/mm
Minimum edge radius (for edge shape inspection)	0.120 mm
Measuring accuracy (of single point @3 σ)	0.016 \pm mm
BLAZER 2L Blisk Blade measuring accuracy:	
Thicknesses	± 0.035 mm
Edge profile shape	± 0.025 mm
Chord length	± 0.035 mm
Airfoil profile	± 0.025 mm
Typical inspection time:	
IBR, 900 mm diameter, 120 mm blade chord, 40 blades, 6 sections	~60 min.
BLAZER 2L Blisk dimensions:	
Length	1800 mm
Width	2400 mm
Height	3200 mm
Weight	2800 kg
Power supply:	
Voltage	110 V / 220 V
Power	2500 VA



BLAZER Compact

BLADE AIRFOIL IN-PROCESS CONTROL

Table mounted optical measuring machine dedicated especially for in-process control of blade airfoil.

BLAZER Compact offers a low-cost and extremely fast solution for profile, thickness, twist control and repair (suitable for after forging control).



Basic Parameters of Measured Object:

Outer diameter	up to 400 mm
Blade chord	up to 100 mm
Maximum weight	15 kg



KEY TECHNICAL CHARACTERISTICS

Parameter	BLAZER Compact
Dedication	Intermediate inspection of airfoil
Maximum blade height (incl. fixture/goniometer)	400 mm
Maximum blade chord	100 mm
Maximum load on rotary surface	15 kg
Lateral resolution	10 pts/mm
Minimum edge radius (for edge shape inspection)	0.40 mm (limited ability)
Measuring accuracy (of single point @3 σ)	± 0.015 mm
BLAZER Compact Blade parameter measuring accuracy:	
Thicknesses	± 0.03 mm
Chord length	± 0.05 mm
Airfoil profile	± 0.025 mm
Typical airfoil inspection time:	
Small blade, 100 mm height, 25 mm chord, 6 sections	30 sec
Medium blade, 250 mm height, 80 mm chord, 10 sections	60 sec
BLAZER Compact dimensions:	
Length	450 mm
Width	570 mm
Height	900 mm
Weight	100 kg
Power supply:	
Voltage	110 V / 220 V
Power	500 VA



BLAZER

Compact Marker

BLADE AIRFOIL IN-PROCESS CONTROL AND DEVIATION MA

Table mounted optical measuring machine dedicated to in-process control of blade airfoil, offering a low-cost and fast solution for profile, thickness, twist control and repair (suitable for after forging control). In addition to the regular Compact machine, BLAZER Compact Marker enables marking of measured deviations directly on the airfoil surface.



Basic Parameters of Measured Object:

Outer diameter	up to 400 mm
Blade chord	up to 100 mm
Maximum weight	15 kg



KEY TECHNICAL CHARACTERISTICS

Parameter	BLAZER Compact
Dedication	Intermediate inspection of airfoil
Maximum blade height (incl. fixture/goniometer)	400 mm
Maximum blade chord	100 mm
Maximum load on rotary surface	15 kg
Lateral resolution	10 pts/mm
Minimum edge radius (for edge shape inspection)	0.40 mm (limited ability)
Measuring accuracy (of single point @3 σ)	± 0.015 mm
BLAZER Compact Marker Blade parameter measuring accuracy:	
Thicknesses	± 0.03 mm
Chord length	± 0.05 mm
Airfoil profile	± 0.025 mm
Typical airfoil inspection time:	
Small blade, 100 mm height, 25 mm chord, 6 sections	30 sec
Medium blade, 250 mm height, 80 mm chord, 10 sections	60 sec
BLAZER Compact Marker dimensions:	
Length	450 mm
Width	870 mm
Height	920 mm
Weight	150 kg
Power supply:	
Voltage	110 V / 220 V
Power	500 VA



EXTENDED BLAZER CAPABILITIES

Metroptic offers a solution that achieves the best measuring results and eliminates the need to invest in expensive accuracy equipment. Metroptic developed the goniometer (a two-axis rotary module) for the automatic blade alignment. The goniometer is compatible with BLAZER 25/2M machines as an add on device.

Two types of Goniometer are available:

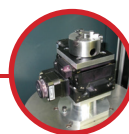
A-TYPE GONIOMETERPage 19
Enabling automatic repair of blade mounting inaccuracy.

B-TYPE GONIOMETERPage 19
Enabling automatic repair of blade mounting inaccuracy and blade cluster inspection.

KEY TECHNICAL CHARACTERISTICS

A-TYPE GONIOMETER

A-type goniometer enables elimination of blade mounting inaccuracy, allowing the use of a simple and cost-effective fixture without compromising measuring accuracy.



Parameter	A-TYPE GONIOMETER
Supported rotary axes	Rx and Ry (rotation about X and Y)
Rx & Ry range	$\pm 2.5^\circ$
Adjustment accuracy	± 60 arc sec
Motion control	2 limit switches per axis
Maximum blade height (incl. fixture)	300 mm
Maximum load on goniometer top plate (blade weight + clamping tool)	3 kg

B-TYPE GONIOMETER

The B-type goniometer provides the same functionality as A-type, with additional blade cluster inspection capabilities.



Parameter	B-TYPE GONIOMETER
Supported rotary axes	Rx and Ry (rotation about X and Y)
Rx & Ry range	$\pm 30^\circ$
Accuracy	± 15 arc sec
Motion control	DC servo
Maximum blade height (incl. fixture)	280 mm
Maximum load on goniometer top plate (blade weight + clamping tool)	3 kg



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