

Model: ZX10

Max. power 100 mW	IP 50	Diode laser	Boresight error <0.2 mrad	Fixed focus	Easy installation	3.5 - 5.5 VDC	Power consumption <1.5 W
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Small size, high performance

The ZX-laser series offers diverse, application specific customization possibilities.

The user can choose from IR and red wavelengths depending on the application and material to be inspected.

The ZX-laser reaches an unrivalled accuracy with its boresight error of less than 0.2 mrad.

The industrial-suited design along with stable performance works perfectly as an integrated module in machine vision applications, sensors or processing machines.

Highlights

- Repeatable high product quality due to automated production processes
- Highest reproducibility of beam quality
- Optical output power up to 100 mW
- Wavelengths from 635 nm - 830 nm
- Fixed focus
- IP 50

Applications

- Positioning tasks
- Machine Vision
- Triangulation sensors
- 3D-Measurement
- Metrology

Order code

Z??	-	X10	-	?	-	?	-	?
Power		Product name		Electronics		Wavelength		Optics

SYSTEM SPECIFICATION

Wavelength	nm	635-685 nm	785-830 nm
Wavelength tolerance	nm (typical)	±10 nm	±4 nm
Wavelength drift	nm / K (typical)	<0.25 nm	<0.25 nm
Output power	mW	≤100 mW	≤100 mW
Spatial mode	(typical)	Single transverse mode	
RMS noise	(20 Hz to 20 MHz) (typical)	<0.5 %	
Peak-to-Peak Noise	(20 Hz to 20 MHz) (typical)	<1 %	
Boresight error ⁽¹⁾	mrad (in x and y)	<0.2 mrad	
Line orientation ⁽²⁾	mrad	<10 mrad	
Pointing stability	μrad / K	<10 μrad / K	
Long-term power stability	(24 h)	±3 % over operating temperature range	
Long-term power stability	(over lifetime)	<5 %	
Start-up time	μs	<70 μs	
Laser operation mode		APC	

ELECTRICAL SPECIFICATION⁽³⁾

Operating voltage	VDC	3.5 - 5.5 VDC
Operating current	(max. at 25 °C)	<250 mA
Protection		LED status indicator, reverse polarity protection / ESD
Electrical isolation		Potential-free housing
Connection		Texas plug
Power consumption		<1.5 W

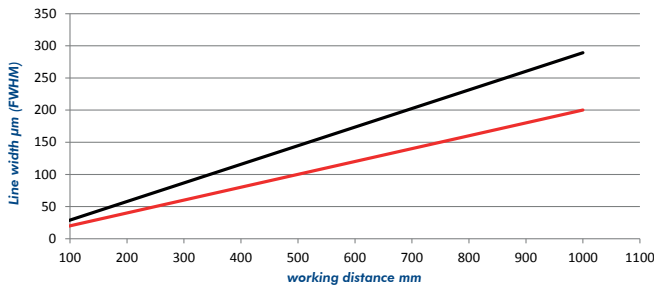
OPTICAL SPECIFICATION

Fan angles ⁽⁴⁾	Degrees	5°, 10°, 20°, 30°, 45°, 60°, 75°, 90° (homogeneous line) 3°, 5°, 10°, 15°, 20°, 30°, 90° (Gaussian line profile)
Line straightness ⁽⁵⁾	%	<0.05 %
Line uniformity ⁽⁶⁾	% (typical)	<25 %
Dot		Point elliptical, point circular
DOE		Multi line, crosses, grids, etc.
Focus range	mm	100 mm up to 10,000 mm (only fixed focus available)

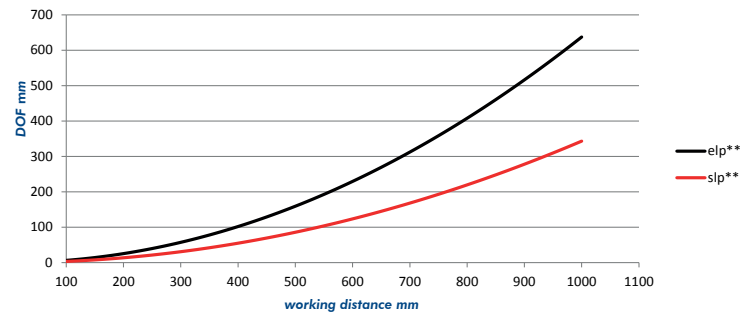
KEYNOTES

⁽¹⁾ Boresight error	Also known as pitch and skew.
⁽²⁾ Line orientation	Line tilt (roll), with reference to the indentation in the clamping area
⁽³⁾ In combination with M-electronic (M=mini). Also available as ND-version (no driver) without driver electronics for OEM applications.	
⁽⁴⁾ Line length / fan angle	at >13.5 % I _{max}
⁽⁵⁾ Line straightness	Deviation from best fit line over the middle 80% of the line, for homogeneous lines
⁽⁶⁾ Line uniformity	Maximum relative optical power variation over the middle 80% of the line, for homogeneous lines and fixed focus

Line thickness vs. working distance*



DOF vs. working distance *



	Wavelength	Calculation factor for line width		Calculation factor for depth of focus	
		slp**	elp**	slp**	elp**
Red	640 nm	1.28	1.00	0.70	0.95
Red	660 nm	1.00	1.00	1.00	1.00
IR	830 nm	1.30	2.11	1.03	2.20

Optical configurations for several line settings are available.

- slp** = standard line Powell; standard setup with medium line thickness and depth of focus.
- elp** = extended line Powell; lines with advanced depth of focus and thicker lines. Recommended for fan angles >75° at working distances <500 mm.

The graphs above show the values for line width and depth of focus of a 660 nm laser. To get the values for a different wavelength the factor from the table above has to be multiplied by the values from the graphs.

Example: 660 nm laser focused at 1 m working distance:
line width approx. 200 µm (@ slp** optic); Depth of focus approx. 350 mm (values from the graphs)

Calculated: 830 nm laser focused at 1 m working distance:
line width approx. 200 µm x 1.90 = 380 µm; Depth of focus approx. 350 mm x 2.37 = 829,5 mm

* Values in the graphs for homogenous line profiles.

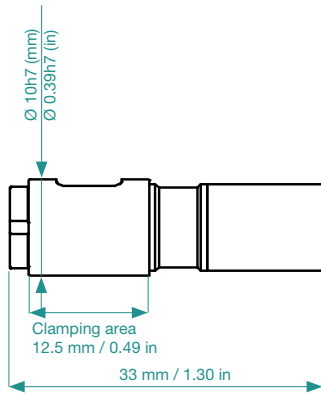
** Fan angle: 5° - 90°

ENVIRONMENTAL CONDITIONS

Operating temperature	°C / °F	-10 °C to +50 °C / 14 °F to +122 °F
Storage temperature	°C / °F	-40 °C to +85 °C / -40 °F to +185 °F
Humidity	%	<90 %, non-condensing
Dissipated heat	W	<1 W
Shock and vibration		According to DIN EN 60068-2-6

MECHANICAL SPECIFICATIONS

	ZX10-M	ZX10-ND (OEM)
Weight	g / lbs	5 g / 0.01 lbs
Length	mm / inch	22.5 mm / 0.89 in
Diameter head Ø	mm / inch	10h7 mm / 0.39 in
Length of cable	mm / inch	2,000 mm / 78.74 in
Connector		Texas plug
Material		Stainless steel



VARIATION

For OEM-applications (e.g. sensor heads) the ZX10 is also available as a ZX10-ND (no driver) version.

