

ILLUMINATION

# Lasiris™ TEC Lasers in UV, Violet, Blue, Red, and Infrared

## FEATURES

- Excellent wavelength and power stability
- Extended lifetime
- Line generators that have a uniform intensity distribution
- Wide range of wavelengths, fan angles and patterns
- Focusable
- Spatial filters available
- ESD, over-temperature, and reverse-polarity protection



## THERMOELECTRICALLY COOLED DIODE LASERS

StockerYale's line of Lasiris™ TEC structured light projectors offers long laser lifetime and excellent wavelength, power and pointing stabilities. The TEC laser's thermoelectric system maintains a constant laser diode temperature, allowing the use of these lasers in applications demanding consistency.

The TEC laser is now available projecting a violet beam, suitable for medical applications. Our design boasts the longest violet diode lifetime, with a 1 year warranty offered on the 404 nm/5 mW laser. TEC lasers also incorporate a patented optical line generator that provides a uniform distribution of light instead of the more common Gaussian distribution. All the interchangeable pattern projection heads of our SNF series laser will also fit on the TEC model.

## APPLICATIONS

The TEC laser is designed for applications requiring stable laser output. Adapted for harsh industrial environments, the TEC produces a stable wavelength over an extended temperature range. The wide range of wavelengths also allows for a variety of uses. Some applications include:

- Medical applications
- Machine vision
- 3D contour mapping
- Alignment
- Positioning
- Industrial inspection
- R&D
- Microscopy

## SOME AVAILABLE PATTERNS

Single Line



Crosshair\*



Parallel Lines



Single Square



Dot Line



7x7 Dot Matrix



Single Circle



7 Concentric Circles



Single dot



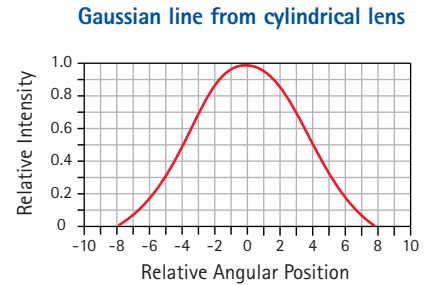
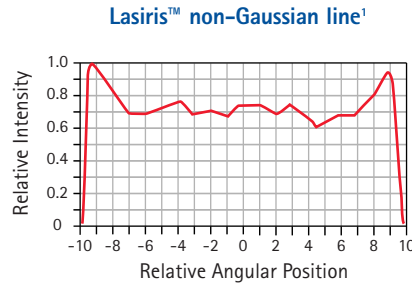
See ordering information section for more patterns or call us.

\* Lasiris™ crosshair projectors have a single optical component, unlike conventional crosshairs that are formed either by using two lasers or by splitting and recombining one beam to form a cross.

## UNIFORM INTENSITY

Laser line patterns are often generated by cylindrical optics that produce a Gaussian line profile with a bright center and fading ends. Lasiris™ patented optics spread the light into an evenly illuminated line. The result is a crisp, uniform line with sharp ends.

### LINE INTENSITY PROFILE ALONG LINE LENGTH



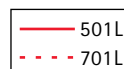
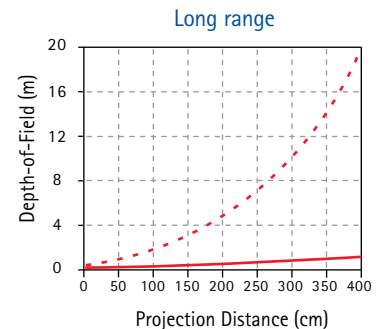
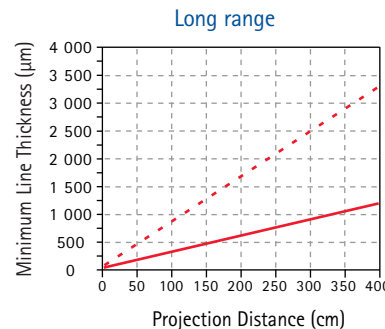
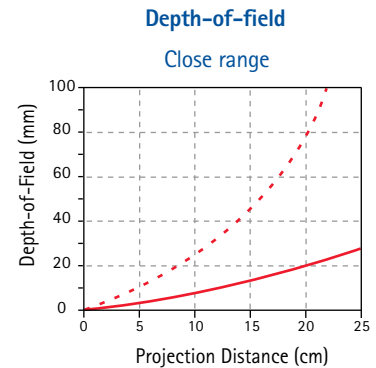
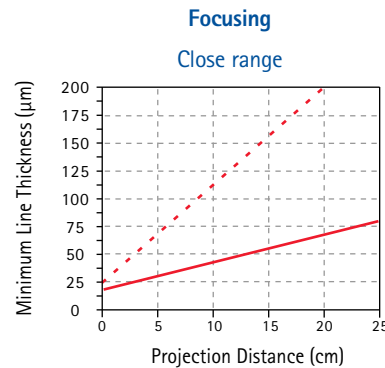
Relative intensity vs. angular position along line length

1) Typical profile

## FOCUSING PERFORMANCE

The following figures show the typical focusing and depth-of-field performance of the TEC laser projector. The focus charts indicate the minimum line thickness (at  $1/e^2$ ) achievable for a specific projection distance. The depth-of-field is defined as twice the distance over which the thickness of the line has increased by a factor of  $\sqrt{2}$ .

### FOCUSING AND DEPTH-OF-FIELD PERFORMANCE



Other lenses are available with different focusing performance curves. Call for details.

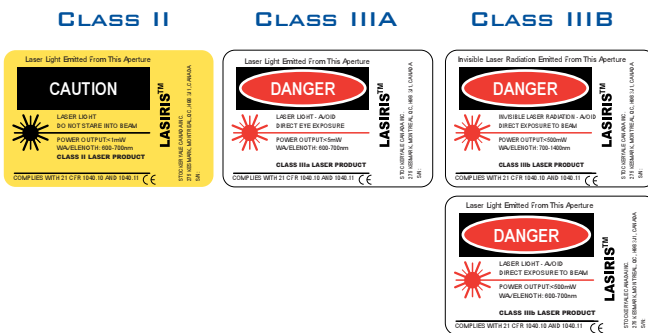
These focus charts are useful for establishing the smallest achievable line thickness for your application. The 501L will produce the smallest line thickness. The 701L produces a thicker line but maintains the line thickness over a longer distance.

The laser can also be adjusted to project a thicker line at a given projection distance, or collimated for minimum divergence. By specifying the desired line thickness and working distance, the laser can be preset to your precise requirements.

## LASERS AND EYE SAFETY

Our lasers can comply with CDRH and IEC certification. Lasers fall in different safety classes depending on output power, wavelength and fan angle.

According to CDRH 21CFR1040.10 regulations, they can be classified Class II, IIIa, or IIIb.



According to IEC 60825-1 regulations, they can be classified Class 1, 1M, 2, 2M, 3R, or 3B. For Class 1M and 2M lasers, viewing the laser output with certain optical instruments (magnifiers, binoculars, etc.) may pose an eye hazard.

Call us or visit our website for further details.

**CAUTION:** It is important to follow laser safety rules and wear appropriate protective eyewear when working around lasers. Use of controls, adjustments or performance of procedures other than those specified in the instruction manual may result in hazardous radiation exposure.

## SPECIFICATIONS

### MECHANICAL SPECIFICATIONS

Weight	210 g
Dimensions	See dimensional diagrams
Housing material	Black anodized aluminum

### OPTICAL SPECIFICATIONS

Diode power	1 to 150 mW, varies with model
Wavelength	375 to 1550 nm, varies with model
Intensity distribution	Uniform (non-gaussian) lengthwise, Gaussian widthwise for line patterns
Fan angles	1 to 90°, varies with model
Line thickness	See focus charts
Bore sighting	<3 mrad

### ENVIRONMENTAL SPECIFICATIONS

Operating temperature	-20°C to +45°C
Wavelength drift	<1 nm over entire operating temperature range

Over-temperature protection, ESD protection

### ELECTRICAL SPECIFICATIONS: POWER SUPPLY

Voltage	6 Vdc ± 0.5 Vdc, Optional 5 Vdc
Current	2.5 A at start, 500 mA at ambient temperature
Internal power control	APC: constant power or ACC: constant current
Connector type	3-wire miniature connector, or custom

Reverse-polarity protection, Over-voltage protection for diode

### ELECTRICAL SPECIFICATIONS: PULSING AND POWER ADJUSTMENT

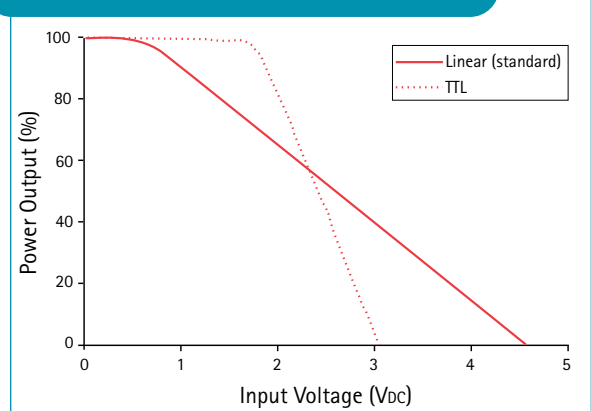
The laser power can be easily changed by rotating the built-in potentiometer. The power can also be modulated or pulsed via an external signal. (Input voltage of 0 Vdc: "on", 5 Vdc: "off").

Pulsing options:

- Standard: code "S": DC to 100 kHz, variable amplitude, adjustable slope on modulation curve
- TTL: code "T": up to 100 kHz.

Impedance	>1 kΩ
Rise / Fall time	1 μsec

### POWER ADJUSTMENT CURVES



\* These curves are approximate.

## ORDERING INFORMATION

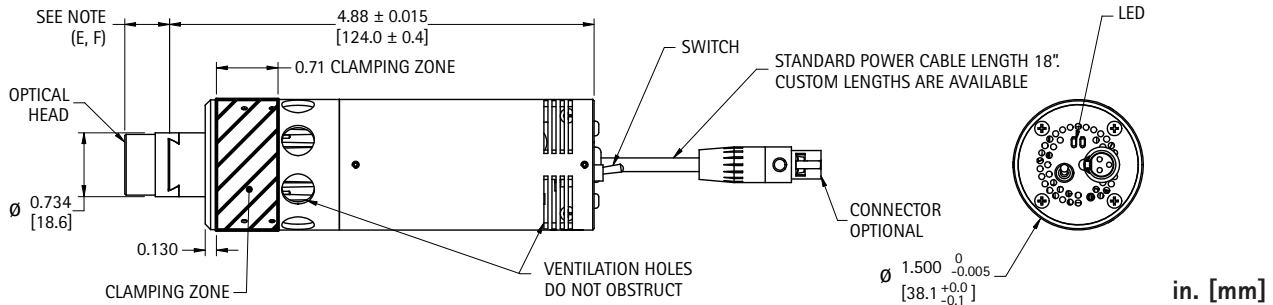
TEC lasers are covered under a warranty (parts & labor) of 1 year for lasers 375 - 440 nm, and of 2 years for 635 - 1550 nm. To order, use this code: TEC - Pattern (substitute "L" for "D" for dot patterns) & Interbeam Angle - Wavelength & "Pulsing & Power Adjustment" (see previous page for coding) - Diode Power - Fan Angle (for line) - Separate Electronics option "SD" (if desired).  
E.g., **TEC-503L(1.5°)-635T-1-5-SD, TEC-599D(0.149)-635S-1**, etc. Call us or visit our website for updates and other specifications.

PATTERN <sup>(a)</sup>		INTERBEAM ANGLE <sup>(b)</sup>	STANDARD WAVELENGTHS <sup>(c)</sup> AND DIODE POWERS		FAN ANGLE
501L or 701L	1 line	-	375 nm	10 mW	1° <sup>(d)</sup>
503L or 703L	3 lines	1.5°, 5.0°, 11.7°	404 nm	30, 60 mW	5°
505L or 705L	5 lines	0.23°, 1.55°	440 nm	20 mW	10°
509L or 709L	9 lines	0.11°, 0.07°	473 nm	5 mW	15°
511L or 711L	11 lines	1.5°	635 nm	1, 5, 10, 15, 35 mW	20°
515L or 715L	15 lines	2.3°	660 nm	1, 5, 10, 20, 35, 50, 100 mW	30°
519L or 719L	19 lines	0.77°	690 nm	20, 35 mW	45°
533L or 733L	33 lines	0.09°, 0.38°	785 nm	20, 35, 75 mW	60°
599L or 799L	99 lines	0.149°	830 nm	30, 100, 150 mW	75°
501S	1 square	Custom	Custom		90° <sup>(d)</sup>
504G	4x4 grid	2.44			Custom
501H	crosshair	-			
501C	1 circle	0.77°, 11.4°			
507C	7 concentric circles	0.77°			
507X	7x7 dot matrix	1.9°			
519X	19x19 dot matrix	0.77°			
Custom					

Other wavelengths and diode powers are available. Please call us for more details.

- (a) Line patterns are also available as dots -- add "D" instead of "L" in the order code  
 (b) At 670 nm  
 (c) Enquire about our green TEC lasers.  
 (d) Not standard for crosshair projector.

## DIMENSIONAL DIAGRAMS



NOTE: (E) ADD 0.500 [12.7 mm] FOR SINGLE LINE GENERATOR  
 (F) ADD 0.900 [22.86 mm] FOR OTHER PATTERNS

Patents: US #4,826,299 / CAN #1,276,827 / US #5,523,889 / Other patents pending

Information and specifications contained herein are deemed to be reliable and accurate. StockerYale reserves the right to change these specifications at any time without notice.



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