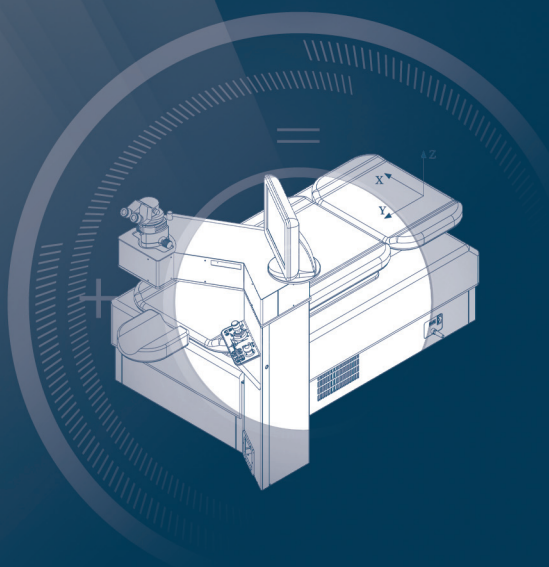




CUSTOMVIS™
PULZAR™ Z1

SOLID STATE REFRACTIVE LASER

-  Solid State Reliability
-  Custom Surgery Solution
-  Superior Tracking Technology
-  1:1 Pre-Op To Treatment Registration



THE FUTURE IN SIGHT™

PULZAR™ Z1 SOLID STATE REFRACTIVE LASER

The high performance PULZAR™ Z1 solid state laser is the future of refractive surgery, allowing truly customised treatment of a large range of vision disorders. By integrating solid state technology with innovative tracking and mapping systems, the Pulzar Z1 reaches new heights of reliability, efficiency and customisation.

The solid state technology generates a small flying spot of 0.6mm with a wavelength of 213nm to accurately ablate the targeted area. The system is designed to give the surgeon a leading edge in laser vision correction through the use of:

Solid State Reliability

Custom Surgery Solution

Superior Tracking Technology

1:1 Pre-Op to Treatment Registration



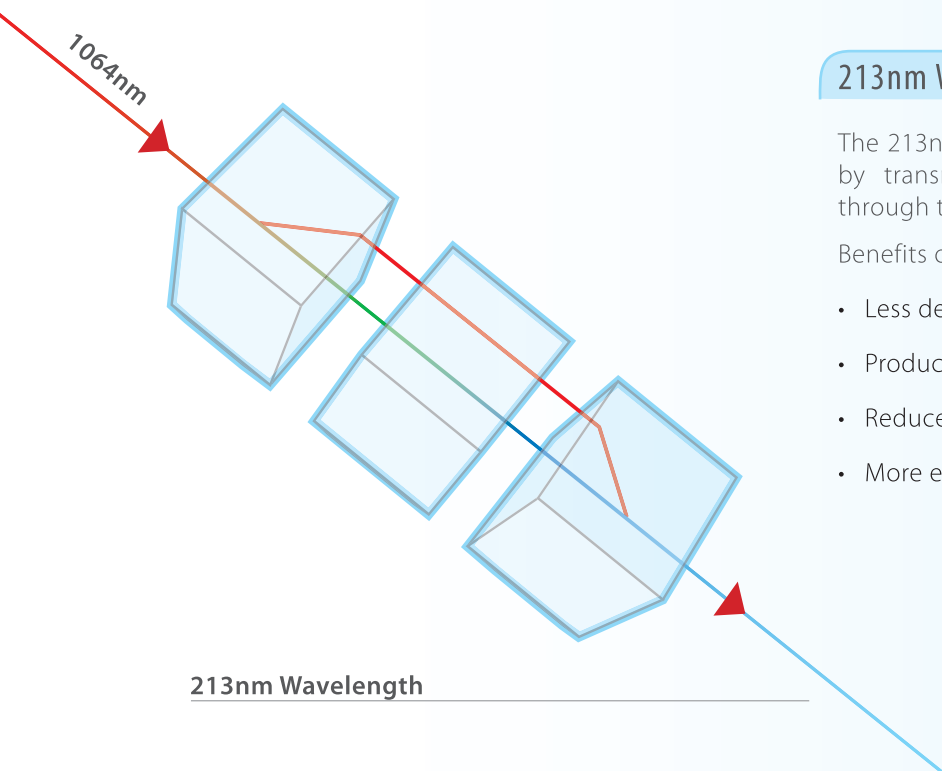
SOLID STATE RELIABILITY

Solid state technology utilises crystals to create a stable and reliable laser source, eliminating the toxic gas associated with conventional excimer lasers. The CustomVis patented crystal technology offers superior reliability and predictability that contributes to excellent surgical outcomes for PRK, LASIK and LASEK procedures.

SOLID STATE TECHNOLOGY

The Pulzar Z1 incorporates a solid state diode pumped Nd:YAG laser and non-linear crystals to offer:

- Stable homogenous beam energy
- Longer laser source lifetime
- Improved reliability and efficiency
- Low power consumption
- Improved beam quality



213nm WAVELENGTH

The 213nm wavelength of the Pulzar Z1 is generated by transmitting the 1064nm Nd:YAG laser beam through three non-linear crystals.

Benefits of the 213nm wavelength include:

- Less dependence on tissue hydration
- Production of clean and smooth ablated surface
- Reduced thermal effect and collateral damage
- More efficient tissue ablation

CUSTOM SURGERY SOLUTION

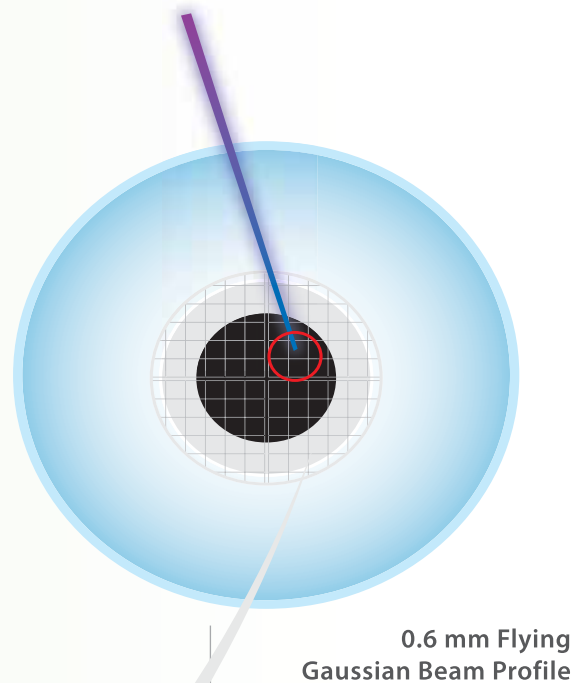
A beam size of less than 1mm is essential for the creation of a superior customised ablation profile¹.

0.6mm FLYING GAUSSIAN BEAM SPOT

The Pulzar Z1 has a 0.6mm Gaussian shaped flying spot, which is one of the smallest spot sizes on the market for refractive surgery.

The Gaussian beam profile with smaller spot size permits fine sculpting of corneal tissue producing smooth ablation surfaces. The flying spot ablates the cornea in a non-sequential pattern to avoid the effects of laser plume and enables tissue thermal relaxation. The proprietary ZCAD™ technology generates the treatment to refine the non-sequential but controlled ablation pattern, to offer:

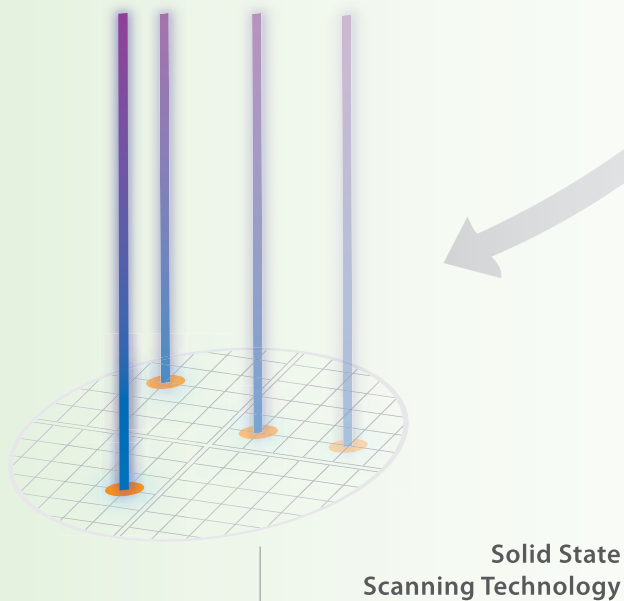
- Improved pulse to pulse energy stability
- Minimal thermal heating of the cornea
- Precise customised ablation profile



CRYSTALSCAN™

The Pulzar Z1 is equipped with CRYSTALSCAN™ high performance ultra-fast solid state scanning technology. This advanced scanning technology is significantly faster than galvanometer based systems used in conventional laser systems, which is very important for achieving a 1kHz closed looped response. CRYSTALSCAN™ has the following advantages:

- Allows much faster response time to eye movement
- Underlies fast closed loop eye tracking (1kHz)
- Solid state reliability, efficiency and accuracy
- Allows true flying spot scan patterns and complex custom surgery without increasing treatment times.



1. Guirao, A., Williams, D.R. and MacRae, S.M. (2003) Effects of Beam Size on the Expected Benefit of Customized Laser Refractive Surgery. *Journal of Refractive Surgery*, 19, 15–23.

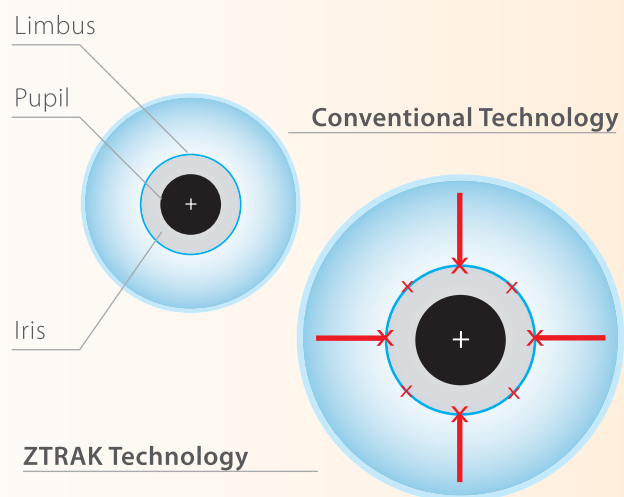
SUPERIOR TRACKING TECHNOLOGY

A fundamental requirement for customised refractive surgery is a fast and accurate eye tracking technique for precise laser positioning. The CustomVis solution to this challenge is the combination of two tracking systems, ZTRAK and GAZETRAK™.

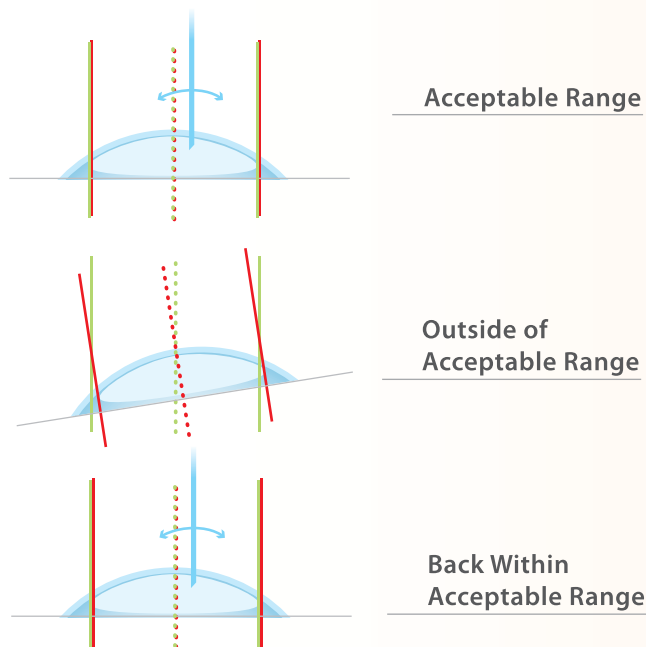
ZTRAK

ZTRAK is a limbus based eye tracking system that combines digital and analogue tracking techniques to monitor and track the patient's eye position during surgery. This information is then passed to CRYSTALSCAN™ for a response rate of 1kHz.

Unlike conventional pupil tracking systems, which do not compensate for pupil centre movements of up to 0.7mm as the pupil diameter changes, ZTRAK - a limbus (constant point) based tracker - maintains an accurate reference point during the corneal ablation which is very important to register custom surgery treatment maps. ZTRAK also eliminates the need for pupil dilatation and possible decentration as a result.



GAZETRAK™



GAZETRAK™ is a unique tracking system that monitors the angle of the patient's gaze and changes the fixation of the eye intra-operatively. With this technique, the laser automatically deactivates as the patient's gaze angle shifts by more than a set minimum range, until gaze direction restores. This ensures accurate laser spot placement on the eye delivering the correct laser pulse to the exact corneal location for optimal treatment.

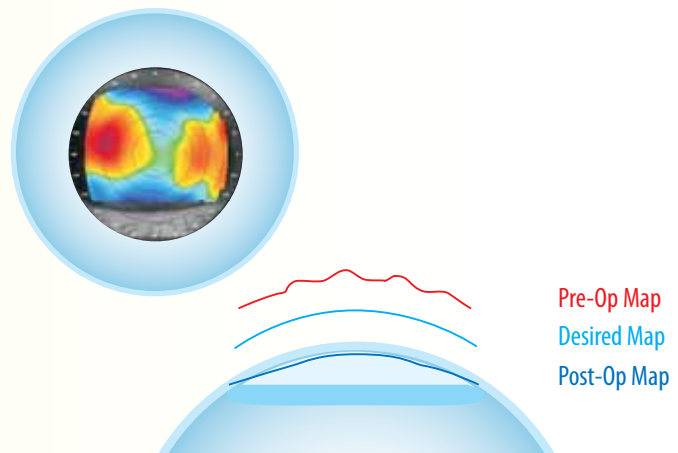
Surgery without GAZETRAK can lead to laser beam misplacement resulting in sub-optimal refractive and poor visual outcomes. As the eye changes gaze direction the traditional lasers continue to fire, resulting in inaccurate ablation. With GAZETRAK, Pulzar Z1 prevents inadvertently decentered ablations allowing for more predictable and reliable refractive outcomes.

1:1 PRE-OP TO TREATMENT REGISTRATION

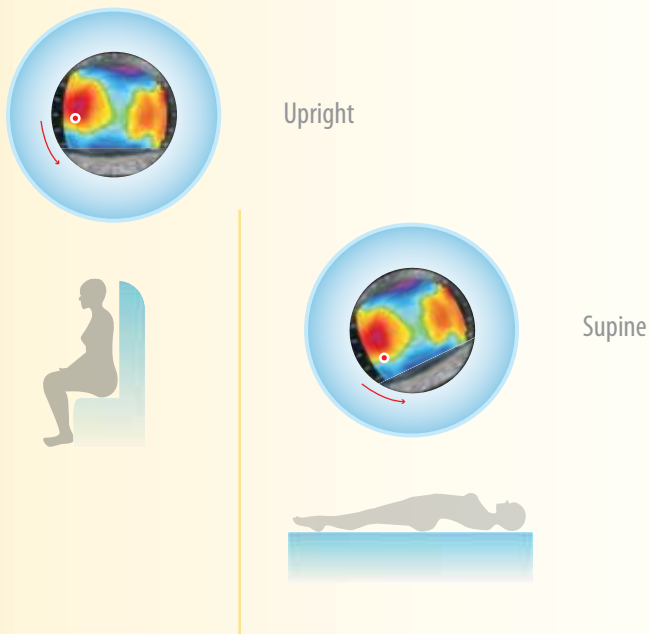
The need for precise pre-op to treatment registration is a prerequisite for custom surgery. This 1:1 registration and matching during treatment planning with ZCAD and Cyclorotation is essential for custom surgery.

ZCAD™

The intelligent ZCAD™ system is an advanced surgical planning application, which incorporates information on the pre-operative condition of each individual eye. Information from various sources, including topography, wavefront analysis, pupil size, pachymetry and refractive data is integrated to determine the patient's treatment plan. The treatment plan produced by ZCAD is introduced into the Pulzar Z1 system via a CD.



CYCLOROTATION

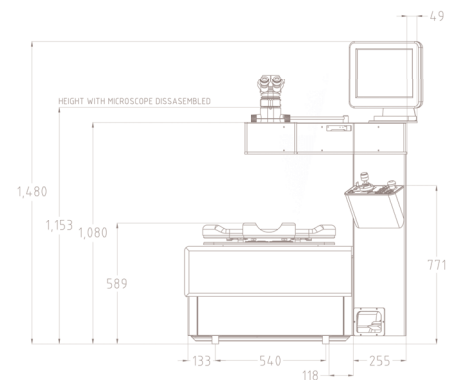
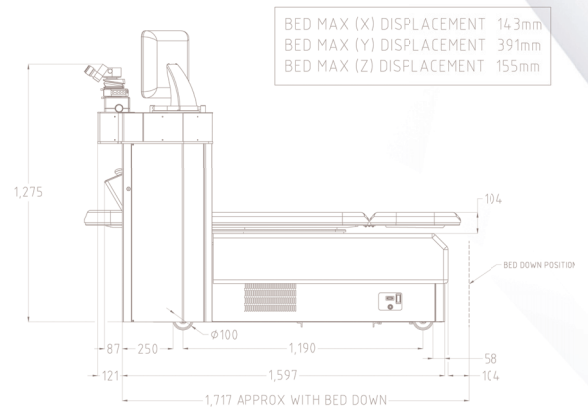


An intelligent 'Pattern Recognition Technique' is used to determine the patient's cyclorotation angle between the pre-operative upright position and supine position. This technique uses a combination of iris and limbal blood vessel pattern matching to compare a pre-operative upright reference image with a pre-operative sample supine image. The treatment is appropriately rotated to compensate for any cyclorotation between the two states relative to the patient's eye for accurate ablation of the corneal surface.

PRODUCT SPECIFICATIONS*

Laser Type:	Quintupled Nd:YAG Solid State Laser
Wavelength:	213nm
Pulse Frequency:	300 Hz
Spot Diameter:	0.6 mm
Ablation Zone:	up to 10.0 mm
Beam Delivery:	Flying Spot (Fixed Size)
Spot Profile:	Gaussian
Max. Laser Output Energy:	1mJ
Eye Trackers:	ZTRAK™ Analogue High Speed Eye Tracker and Video Eye Tracker GAZETRAK™ Intra-Operative Gaze Tracker Cyclorotation Registration
Surgery:	Standard Treatment, Topography & Wavefront Guided
Focusing Beams:	2 x White Light Slits
Microscope:	Leica (Customised)
Screen:	Touch Screen
Operating System:	Microsoft Windows™
Line Voltage:	220 - 240 VAC Single Phase
Line Frequency:	50 Hz
Electrical Power:	2.4kVA (max)
Mechanical Footprint:	1.8m x 1.1m x 1.5m

*all specifications subject to change without notification



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