

# SCHWIND AMARIS® 500E – Cutting edge technology impressively efficient

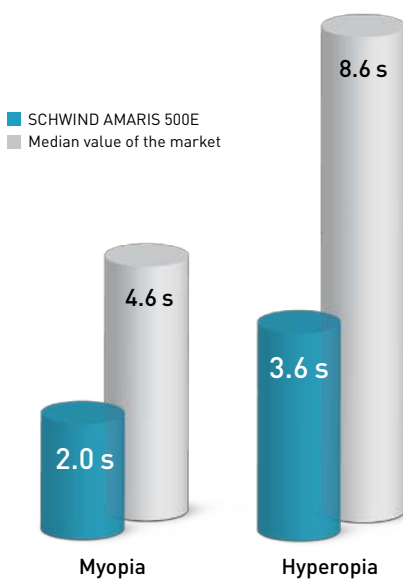


# SCHWIND AMARIS® 500E – Cutting edge technology from the technology leader

Everything that a patient can expect from corneal surgery today: the SCHWIND AMARIS® 500E stands for the perfection of a premium product. The high performance of this TotalTech Laser across all disciplines has been proven through numerous clinical studies – so that you can provide treatment that combines top results with high safety.

## A step ahead

Fast and safe – the SCHWIND AMARIS 500E combines an extremely high ablation speed of 500 Hertz with a turbo 5D eye tracker, which actively compensates for the eye movements in five dimensions. The result is a good balance between high speed and excellent precision in ablation. In addition, the SCHWIND AMARIS 500E has the key advantages that come with being a leader in technology, such as automatic energy adaptation with Automatic Fluence Level Adjustment, temperature control with Intelligent Thermal Effect Control, the online pachymetry safety system, as well as the SCHWIND CAM software so you can plan customised treatment.



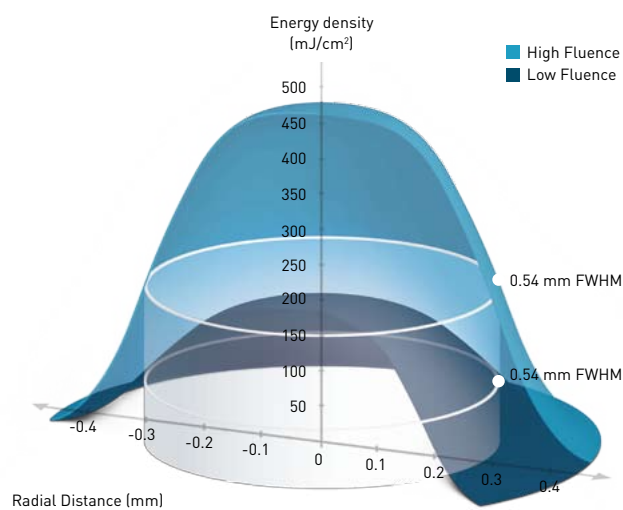
SCHWIND AMARIS 500E:  
ablation time per dioptr (s/D)\*

\* Without astigmatism, 12.5 mm vertex distance,  
6 mm optical zone

## Fast ablation, optimum smoothing

Thanks to the Automatic Fluence Level Adjustment (AFLA) the SCHWIND AMARIS 500E achieves perfect results. Researchers at SCHWIND have developed an algorithm based on complex mathematical calculations which ensures an ideal balance between the total number of laser pulses and the energy delivered. About 80 percent of the ablation is performed with a high fluence value. For the fine work – the remaining 20 percent – the SCHWIND AMARIS 500E automatically switches to a lower fluence. The result is optimum smoothing of the cornea.

Through the extremely small spot size and the Super-Gaussian beam profile you achieve an exceptionally smooth and tissue saving ablation.



## Automatic Fluence Level Adjustment

Ideal balance between the total number  
of laser pulses and energy delivered

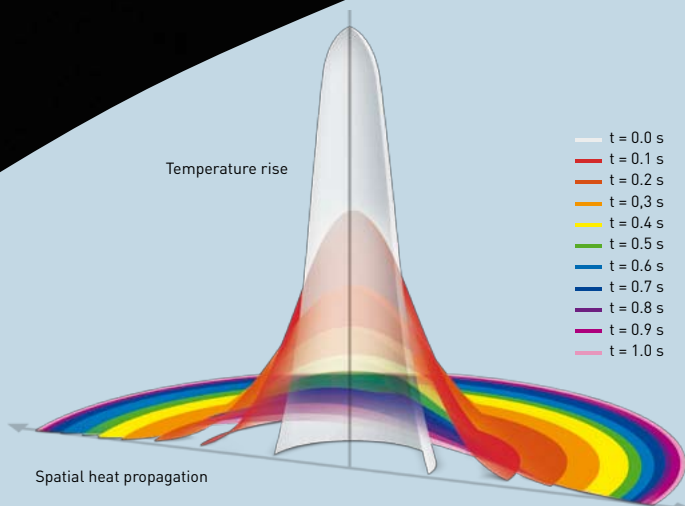
» The results with the  
SCHWIND laser are the  
best I've ever seen. «

Michiel Luger, MD, VisionClinics,  
Utrecht, Holland

## We combine control and intelligence to ensure greater safety for your patients

»» The thermal control technology and ablation control with two fluence levels plays a very important role, especially in the biological aspects: the less biological interaction there is with corneal tissue, the more reliably wounds can heal. ««

Jorge Alió, MD, Visum Medical Ophthalmologic Corporation, Alicante, Spain



Heat propagation of a laser pulse with the ITEC method

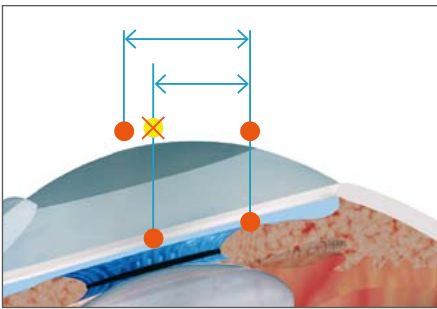
### Just as effective as it is gentle

Intelligent Thermal Effect Control – ITEC – is the name of the thermal control process, that prevents damage to the surrounding corneal tissue, even at a high ablation speed. ITEC ensures that the laser pulses are distributed in a thermally optimised, dynamically adapted way, which gives the individual position on the cornea sufficient time to cool off. Following pulses can thereby approach an already cooled position faster. ITEC is clearly superior to the otherwise customary static procedures. Studies using an infrared thermographic camera have proven that the corneal tissue only heats up by a maximum of 4° Celsius, even at high ablation speeds.

## Safety in five dimensions

Speed is only good combined with precision. The 1,050 Hertz turbo eye tracker ensures precise positioning of each individual laser pulse and precisely compensates for any eye movement up to the fifth dimension.

A precise centring of the eye and extremely precise positioning of the laser spot are decisive factors during laser treatment. Apart from the linear eye movements in the first and second dimensions (X/Y axis), the eye tracker of the SCHWIND AMARIS 500E can precisely determine and compensate for horizontal and vertical rolling movements (third and fourth dimensions).



Compensation of rolling movements (3<sup>rd</sup> and 4<sup>th</sup> dimensions)

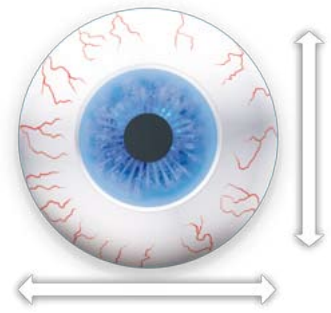
### Limbus tracking

Simultaneously with pupil detection, the eye tracker also detects the limbus, whose size always remains constant – unlike the diameter of the pupil. For this reason, the limbus is used as a reference for ablation, meaning that the original centre of ablation is maintained throughout the laser treatment. This has the great advantage for your patients that decentrations are prevented, and no pupil dilating medication is necessary prior to treatment.

### Advanced Cyclotorsion Control

In addition, the SCHWIND AMARIS 500E eye tracker detects and compensates for rotations around the visual axis: the cyclotorsion, also known as the fifth dimension. It perfectly compensates for static cyclotorsion, meaning torsional differences between upright and supine positions of the patient, as well as for dynamic cyclotorsion, meaning the rotational movements of the eye during the laser treatment procedure.

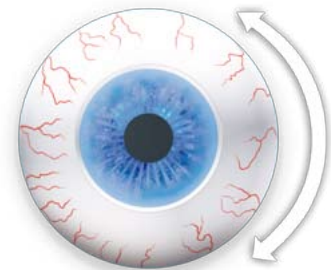
Automatic monitoring of the pupil size during static cyclotorsional control ensures additional safety. The illumination is automatically adjusted so that the pupil remains exactly the same size at the beginning of the treatment as it was at the preoperative examination.



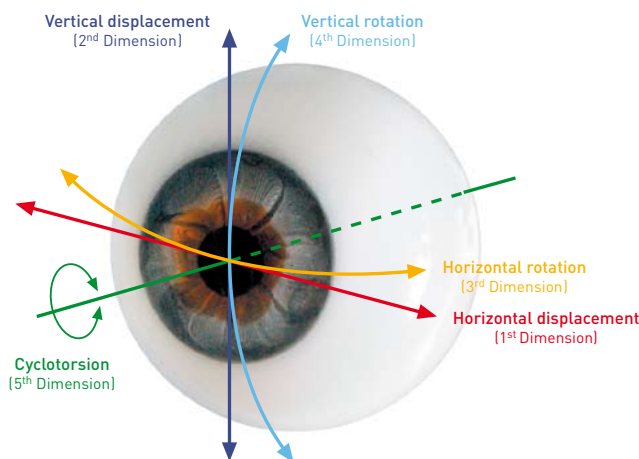
Linear movements (1<sup>st</sup> and 2<sup>nd</sup> dimensions)



Rolling movements (3<sup>rd</sup> and 4<sup>th</sup> dimensions)



Cyclotorsional movements (5<sup>th</sup> dimension)





## Plan perfectly for any situation

Each treatment is different: that is why the SCHWIND AMARIS 500E with the integrated and modularly designed SCHWIND CAM software makes it possible for you to plan treatment individually for your patients for a wide range of applications in corneal surgery. Whether corneal or ocular wavefront – all the required diagnostic data are incorporated into planning. You can be sure that you will not leave out any detail important for the individual ablation.

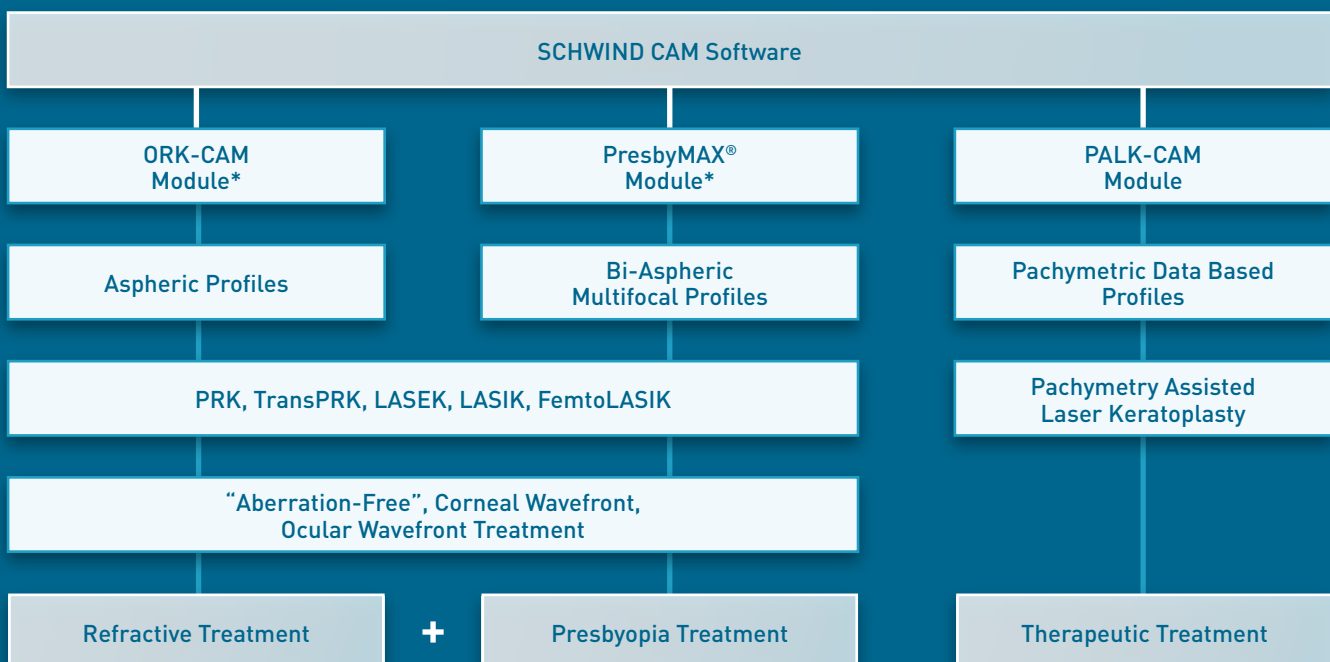
## SCHWIND CAM modules: the advantages

**ORK-CAM:** a one-of-a-kind intelligent planning tool for extensive and customised refractive laser treatment. Whether “Aberration-Free” or customised treatments based on corneal or ocular wavefront data – aspheric ablation profiles are used.

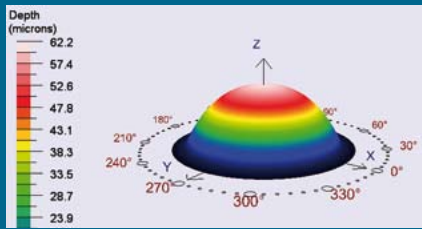
**PresbyMAX®:** makes it possible to safely and efficiently treat emmetropia, myopia and hyperopia, as well as astigmatism in patients whose accommodative response is limited. PresbyMAX is based on bi-aspheric, multifocal ablation profiles.

**PALK-CAM:** allows for safe and extremely precise planning of lamellar keratoplasties. The innovative planning tool is based on the Pachymetry Assisted Laser Keratoplasty (PALK) method. It is suitable for patients who need a corneal transplant and whose endothelium is healthy.

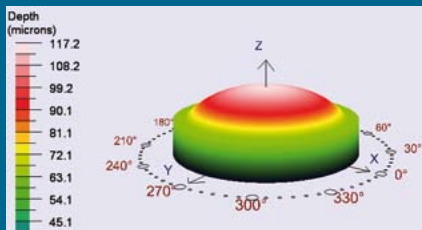
## SCHWIND CAM modules



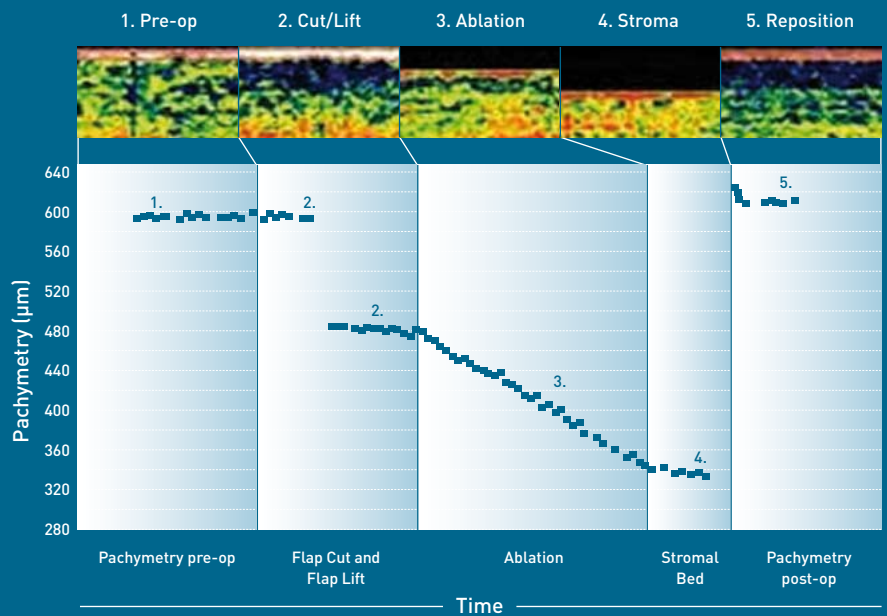
\* with Static Cyclotorsion Control



PRK profile in myopia treatment



TransPRK profile in myopia treatment



Online Pachymetry

### TransPRK – “No-Touch” treatment

SCHWIND has further developed the established surface treatments and has adapted them especially for the ORK-CAM software module. The result is what we call TransPRK – the only surface treatment in which the epithelium is ablated with the laser. No instruments touch the eye, and the epithelium can be ablated more precisely and more easily than before. Smaller wound areas speed up the healing process. The ablation of the epithelium and the actual refractive treatment are performed in a single step.

### High resolution online pachymetry

The integrated contact-free optical pachymetry provides you with precise information about the thickness of the cornea throughout the entire duration of the treatment. The

changes are measured and displayed on the treatment screen online. The measurements are taken before the preparation and after lifting of the flap, as well as during and after the laser treatment. This ensures that you know exactly how much you have already ablated at all times and how thick the remaining cornea still is, which increases the intraoperative safety in refractive treatments. All data are documented in the treatment log.

### Ideal climatic conditions

That's innovation that works in practice: the unique particle aspiration system of the SCHWIND AMARIS technology ensures stable microclimatic conditions across the cornea. The SCHWIND flow design serves as the basis: a thin, laminar stream of air flows exactly 40 millimetres above the cornea. Particles that could shield energy during the ablation are thereby effectively removed. At the same time, the climatic conditions remain constant, preventing the cornea from drying out.

»» The SCHWIND laser fulfills a long list of crucial needs and wishes expressed by eye surgeons in all areas. ««

Thomas Neuhann, MD,  
EuroEyes ALZ Eye Clinic, Munich, Germany

**Designed for perfect processes**

We have cast the SCHWIND AMARIS 500E in a compact, ergonomic and mobile design. A series of helpful features facilitate and support your work with the laser. All operating elements are easy to reach and are clearly arranged, ensuring that you can concentrate fully on your work with the patient.

**The advantages are in the details**

The swivelling patient bed provides added operating comfort. You can use the bed for other stages of treatment without having to change the position of the patient.

With its good contrast, true colour brilliance and a superior depth of focus the high-end microscope developed especially for use with the excimer laser provides optimum working conditions.

The diagnostic slit lamp for flap checking has a compact design and can be moved around two axes across the entire working area.

The exact positioning of the patient eye can be checked using the integrated slit lights. A tilting or decentration of the eye is easy to detect, and the position can be adjusted.

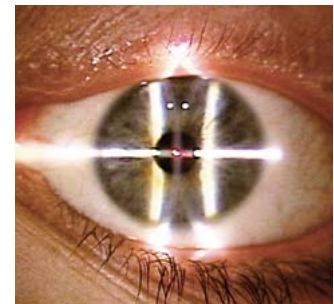
At 235 millimetres, the free working distance between the laser arm and the patient's eye is generously dimensioned. This makes it possible for you to work comfortably and safely with the microkeratome.



Swivelling patient bed



Diagnostic slit lamp



Integrated slit lights

➤ The control elements are easy to reach and can be operated conveniently. ◀◀  
 Maria Clara Arbelaez, MD, Muscat Eye Laser Center, Muscat, Oman



# SCHWIND AMARIS<sup>®</sup> 500E

## At a glance

|   |   |
|---|---|
| Laser type                              | ArF-excimer laser, 193 nm, laser class 4  |
| Beam size                               | 0.54 mm Super-Gaussian profile (FWHM)   |
| Repetition rate                         | 500 Hz, with Intelligent Thermal Effect Control   |
| Ablation time                           | 2.0 s/D (Myopia, without astigmatism, 12.5 mm vertex distance, 6 mm optical zone)   |
| Beam delivery                           | Flying spot, with Automatic Fluence Level Adjustment  |
| Eye tracking                            | 5D, 1050 Hz turbo eye tracking<br>Reaction time: 3 ms<br>Pupil and limbus tracking<br>Compensation of lateral movements (1 <sup>st</sup> and 2 <sup>nd</sup> dimensions)<br>Rolling balance (3 <sup>rd</sup> and 4 <sup>th</sup> dimensions)<br>Optional: Advanced Cyclotorsion Control – static and dynamic (5 <sup>th</sup> dimension)<br>Automatic pupil size control<br>Pupil centre shift compensation |
| SCHWIND CAM software                    | ORK-CAM module – refractive treatment<br>PresbyMAX <sup>®</sup> module – presbyopic treatment (PPF)<br>PALK-CAM module – therapeutic treatment (PPF)  |
| Refractive treatment range              | PRK, TransPRK, LASEK, LASIK, FemtoLASIK, PTK<br>"Aberration-Free" treatments<br>Customised treatments based on corneal and ocular wavefront   |
| Integrated online pachymetry            | Optional  |
| Particle aspiration system              | Integrated  |
| Patient bed                             | Up to 90° swivelling  |
| Treatment Assistant Manager             | Course of treatment can be configured individually  |
| Surgical microscope                     | Superior depth of focus<br>Tube swivelling range 10° to 50°<br>Camera beam splitter integrated<br>Optional: Camera video system with DVD recorder   |
| Computer                                | Panel PC – 17" touch screen monitor, pivotable on 2 axes,<br>additional dot-matrix-display, washable keyboard with integrated touchpad  |
| Diagnostic slit lamp                    | Optional<br>Swivelling on 2 axes<br>4 selectable diaphragms (3 slits, 1 circle)   |
| Working distance                        | 235 mm  |
| Voltage / power consumption             | 100, 110, 120, 127 VAC, 50/60 Hz, max. 20 A<br>208, 220, 230, 240 VAC, 50/60 Hz, max. 10.5 A  |
| Footprint (LxWxH) including patient bed | 2265 mm x 1486 (±50) mm x 1335 mm   |
| Compliance                              | CE conformity in accordance with Medical Device Directive (MDD) 93/42/EEC   |

Optimum functionality, reliability and compliance with all legal regulations can only be assured through the use of products supplied by SCHWIND – whether as single items or as a combined system.