

# OCULUS | Keratograph 5M

Topographer



OCULUS®

We focus on progress



# OCULUS Keratograph 5M

More than just a topographer!

Keratograph 5M technology is a revolution in corneal topography and dry eye analysis. The high-resolution colour camera and the integrated magnification changer offer a new perspective on the tear film assessment procedure.



## Measurements with Placido disc illumination

The white annular illumination is used to precisely measure thousands of points on the surface of the cornea. Infrared annular illumination is available during tear film analysis to prevent light reflection and glare.



## Measurements with light emitting diodes

The Keratograph 5M provides the ideal illumination for every application: white diodes for the assessment of tear film particles movement, blue diodes for fluorescein imaging, infrared diodes for meibography.

In addition to these unique features the Keratograph 5M measures corneal topography precisely. The built-in real keratometer and automatic measurement activation guarantee perfect reproducibility of K values. Data is acquired by non-contact measurement, automatically analysed and shown in comprehensive presentation formats.

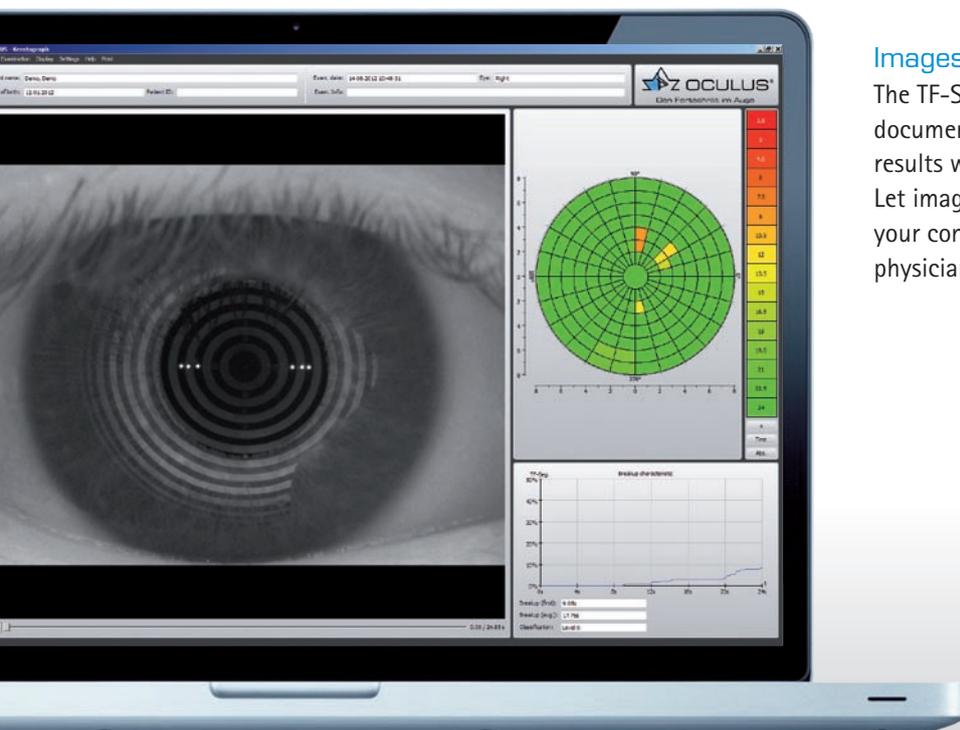
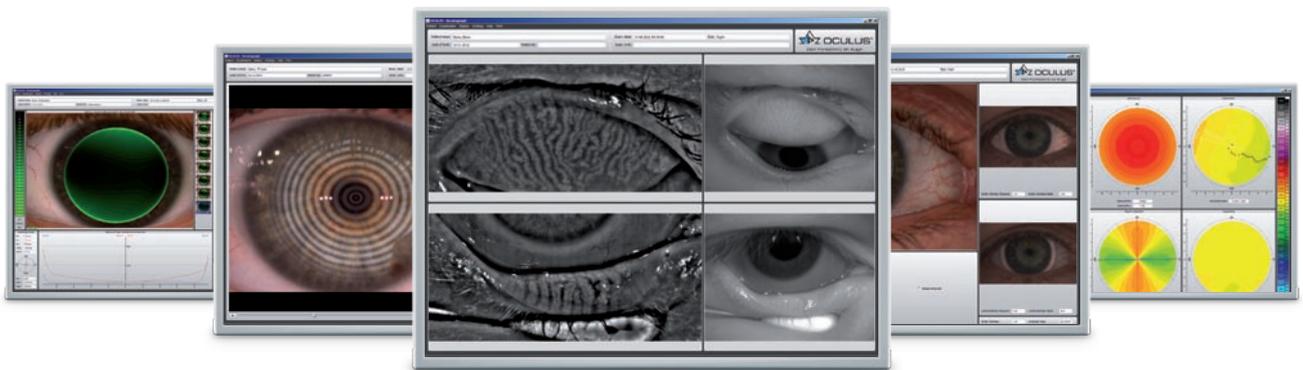
# Clear Presentation

More transparency for your services

Integrate the Keratograph 5M into your practice as an active patient consultation tool. Thanks to many visual maps and easy to understand diagrams the Keratograph 5M enhances communication with your patients. Use your Keratograph 5M as a marketing tool and promote patient confidence.

## Build trust

The Keratograph 5M enables you to show images your patients have never seen before. Build trust by providing professional consultation during examinations and follow-ups.



## Images speak louder than words

The TF-Scan software allows you to analyse and document tear film break-up time and share the results with your patients.

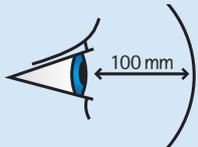
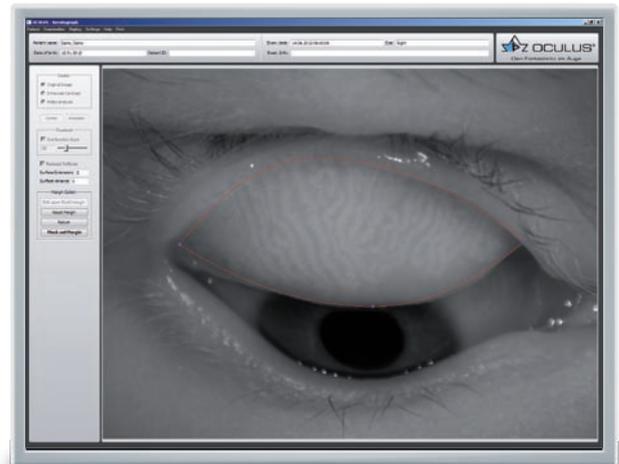
Let images and videos speak for themselves during your consultation – this creates a strong physician/patient relationship.

# Meibo-Scan

## Meibography of the upper and lower eyelid

The new Keratograph 5M is a multi-purpose diagnostic device that easily and efficiently integrates complex examinations such as meibography into ophthalmological and optometric practices.

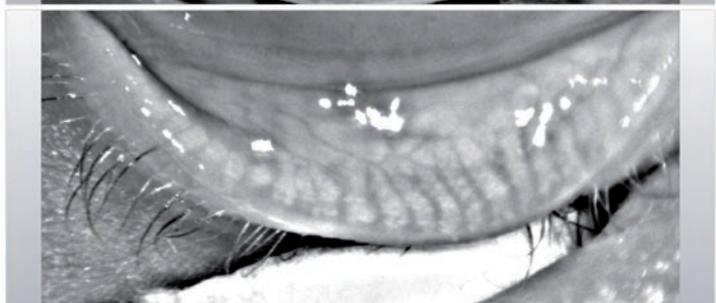
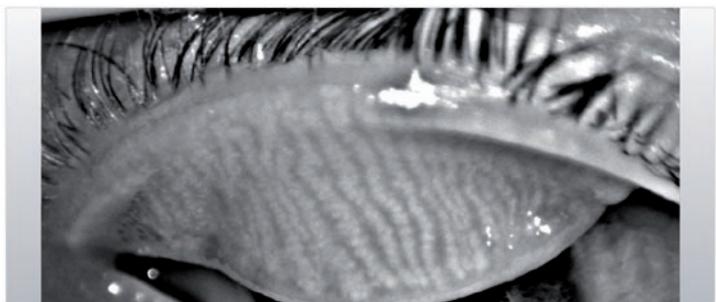
Dry eye is most commonly caused by meibomian gland dysfunction (MGD). Meibo-Scan reveals morphological changes in the glandular tissue.



The new Keratograph 5M is patient-friendly and takes measurements at a greater distance from the eye. An image section of 26mm permits optimal examination of the lower and upper eyelids.

## 3D display of the meibomian glands

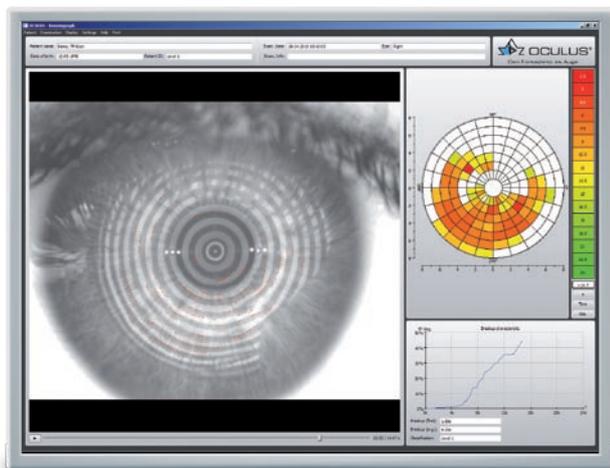
Different viewing options such as 3D display, various section planes and marking of the individual area of examination make it easy to evaluate the meibomian glands or morphological changes in the upper and lower eyelids.



# TF-Scan

## Visualising tear film quality and quantity

The OCULUS Keratograph 5M evaluates the tear film with the aid of white or infrared illumination. The new high-definition colour camera makes finest structures visible. NIKBUT (non-invasive Keratograph break-up time), tear meniscus height, lipid layer and tear film particles movement are examined carefully and documented with ease. The exams are non-invasive, user-friendly and reproducible.

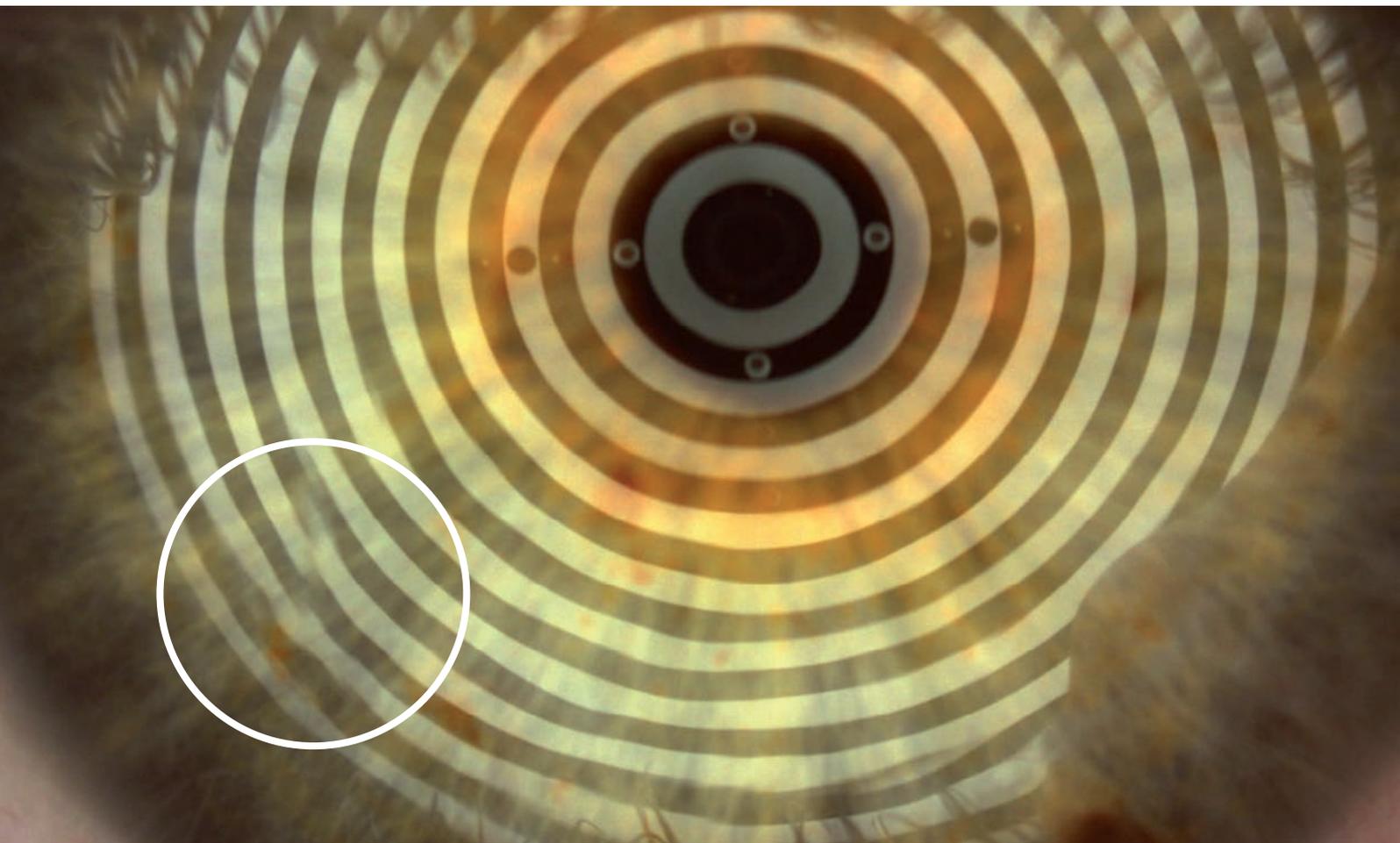


## NIK BUT

### Evaluation of tear film break-up time

Tear film break-up time measurement with the Keratograph 5M is touch-free and fully automatic. The new infrared illumination is invisible to the human eye and produces no glare during the examination and no reflex tearing.

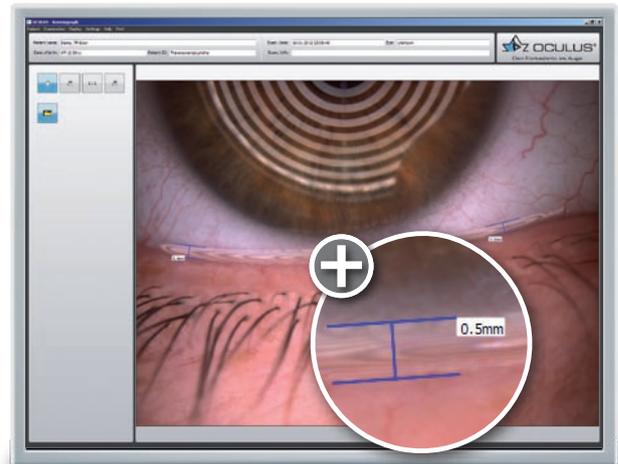
TF-Scan maps tear film break-up time, making it a great tool for follow-up and patient consultation.



## Tear meniscus height

### Evaluation of tear film quantity

With an integrated measuring guide and various magnification tools you can measure tear meniscus height and evaluate its characteristics along the lower lid margin. The result is saved in the patient file.



## Lipid layer

### Evaluation of lipid layer thickness

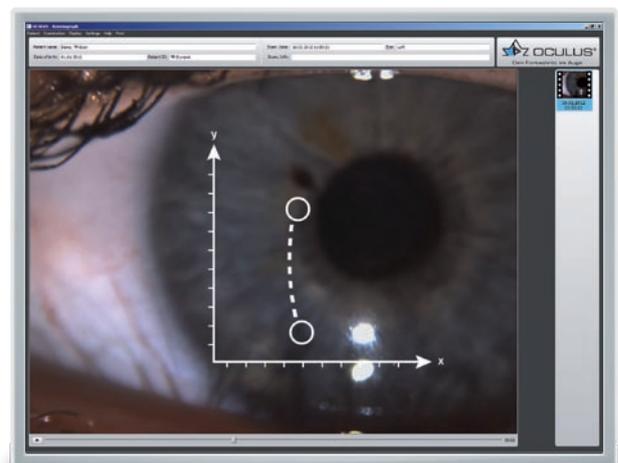
The colour and structure of the lipid layer are visualised and can be recorded. Measurements are taken of lipid layer thickness, which correlates with tear film evaporation and dry eye symptoms. If the lipid layer is too thin or absent, the tear evaporation rate and tear film instability increase.



## TF dynamics

### Evaluating the particle flow characteristics

A video recording with up to 32 images per second, permits observation of tear film particle flow characteristics and shows tear film viscosity.



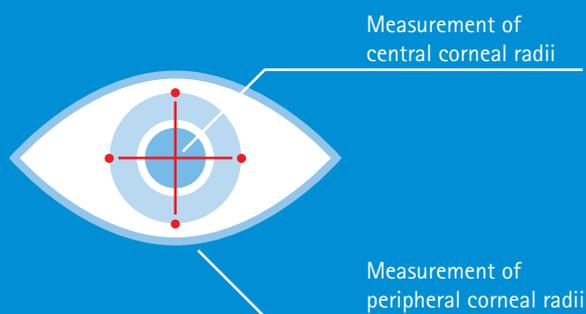


How does topography actually work using the Keratograph?

## Corneal topography using an Ophthalmometer

For many years ophthalmometers were the instruments of choice for measuring corneal radii. Being able to determine two central and four peripheral radii brought many advantages when it came to fitting contact lenses. The flattening of the cornea was determined on the basis of only six measurements.

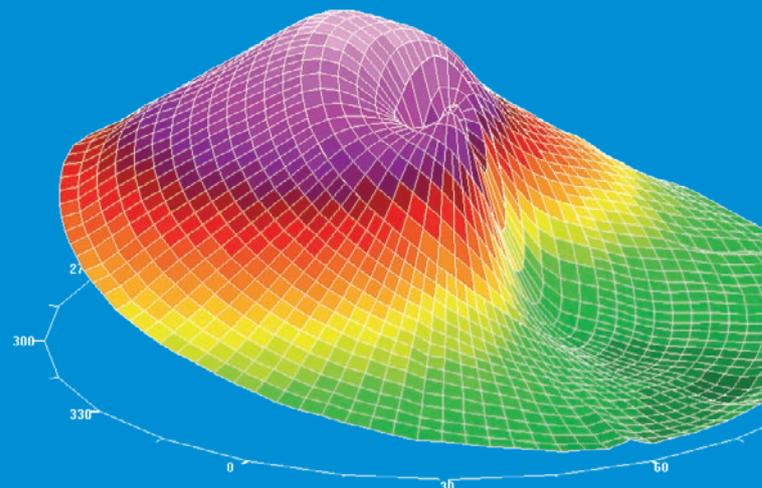
The disadvantages of taking measurements with an ophthalmometer were not to be dismissed, however. The measuring time is relatively long and the measuring data must be calculated afterwards. Making eye movements to the peripherally placed targets can be very strenuous. What is more decisive, however, is that local irregularities between these measuring points are not recorded. In cases where the cornea shows very pronounced irregularities (e.g. in cases of keratoconus) the targets are often so distorted that measurements are very difficult to take or cannot be taken at all. Ophthalmometers certainly provide good results but taking measurements with this instrument requires quite a bit of practice.



## Measurements using the Placido method

In the late 19th century, scientists designed an instrument which produced surface rather than point-by-point measurements of the cornea. The basis for this was the Placido disc (named after the Portuguese ophthalmologist Placido). Video keratometers, also called video keratoscopes or video keratographs, are widespread today – with the OCULUS Keratograph and the OCULUS Easygraph being established market leaders.

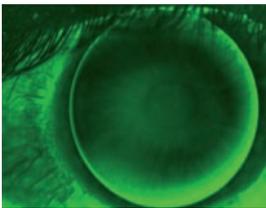
**Look at the cornea in a completely new way**  
With over 22,000 measuring points the OCULUS Keratograph provides precise representations of the cornea.



# Imaging

## High-definition colour camera for image and video documentation

The Keratograph 5M provides optimal imaging capabilities and a new high-definition camera. This opens new doors for documentation during everyday practice. Experience the highest level of multi-functionality, similar to a digital slit lamp. Selectable illumination and variable magnification provide the basis for high-definition imaging and video recordings. Thanks to its user-friendly operation the camera can be easily integrated into daily practice routine and facilitates efficient documentation of examinations.



### For contact lens fitting

Evaluate the static and dynamic fit of rigid gas permeable and soft contact lenses as well as wetting and drying times with ease.



### For documentation of diagnostic findings

Even illumination and a high depth of field are especially important for professional documentation of diagnostic findings. Recordings are saved automatically.



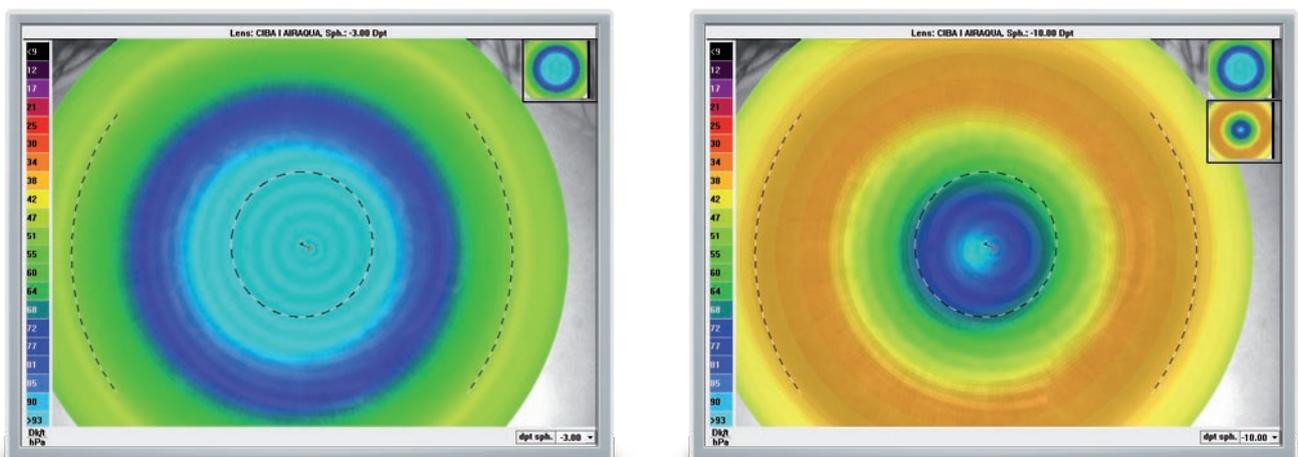
# OxiMap® – Visualising Oxygen Transmissibility

## Professional patient consultation

The cornea needs oxygen, and a good oxygen supply is therefore fundamental for the comfort of contact lens wearers. New materials used for soft contact lenses offer excellent oxygen transmissibility. This can be demonstrated using the new OCULUS OxiMap® display. You can easily show these colour maps to your patients in order to better explain your contact lens recommendation.

## How much oxygen really reaches the cornea?

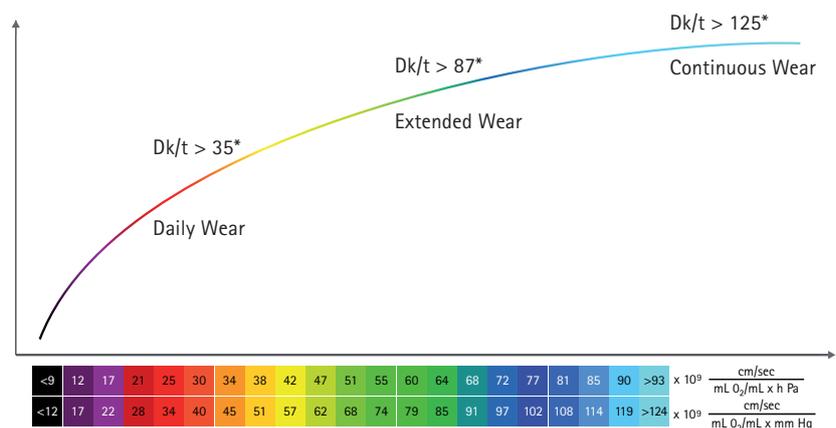
Until now, oxygen transmissibility values could only be given in reference to the center of a -3.00D contact lens – OxiMap® shows oxygen transmissibility as a function of lens material and lens thickness. OxiMap® is available for the most frequently sold spherical soft contact lenses. This convenient tool assists you in consulting with customers to select the most suitable contact lens.



> Oxygen transmissibility of -3.00D and -10.00D contact lenses of identical type

## Clear and comprehensive visualisation is key to ensuring patient loyalty

Contact lenses act as a potential barrier to oxygen transport even when the eyes are open. Long hours of wearing comfort can only be guaranteed with a sufficient oxygen supply. OxiMap® shows the oxygen transmissibility of contact lenses on a colour scale to depict the international recommendations for daily, extended and continuous wear.

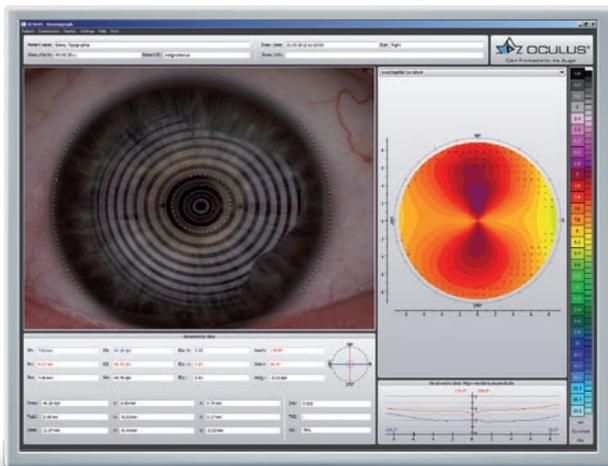


> OxiMap® colour coding of Dk/T-values and recommended wearing times

# Basic Software

Lucid presentation of precise analyses

The comprehensive basic software contains various analyses for everyday use including everything from topography to automatic keratoconus detection as well as an extensive contact lens database.

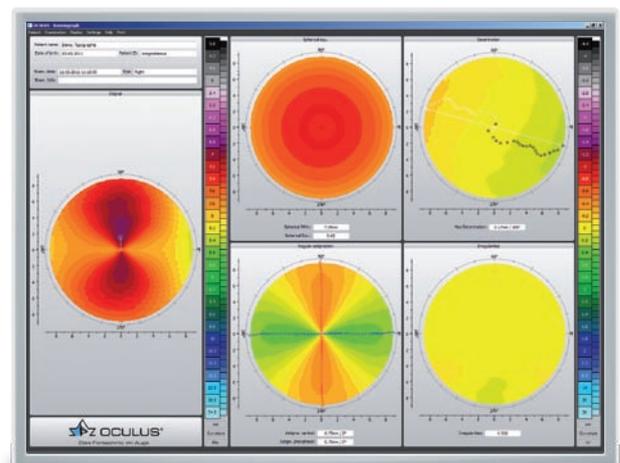


## Overview and 3D Displays

The built-in keratometer guarantees utmost measuring precision and reproducibility of the real K values. The overview display shows the keratometric values, central radii, corneal astigmatism, eccentricity and corneal diameter. The colour topography map shows the curvature of the anterior corneal surface.

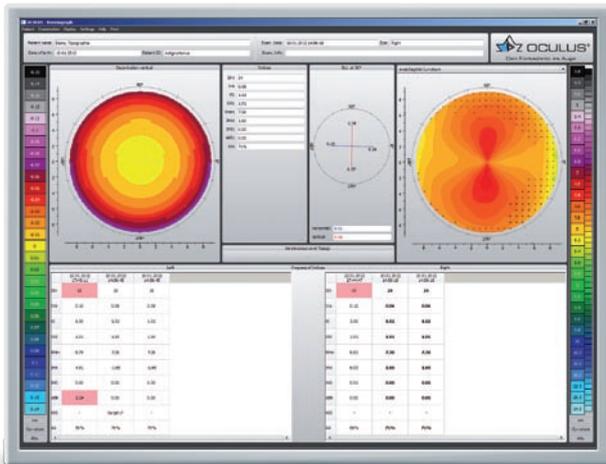
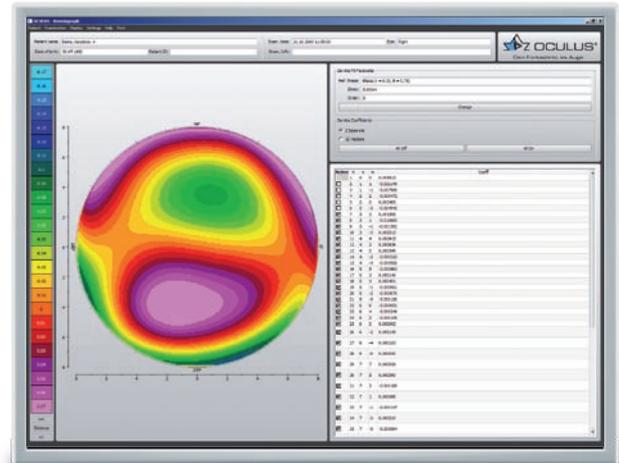
## Fourier Analysis

Fourier Analysis is an important tool for visualising the degree of corneal irregularity. The topography map is divided into individual components for this purpose. The first three are standard components that represent lower order aberration while the fourth map shows the degree of corneal irregularity or higher order aberration.



## Zernike Analysis

Zernike Analysis provides a means to describe specific irregularities of the cornea. An elevated aberration coefficient indicates a decline in retinal image quality. Zernike Analysis makes it possible to determine the exact position of the apex.



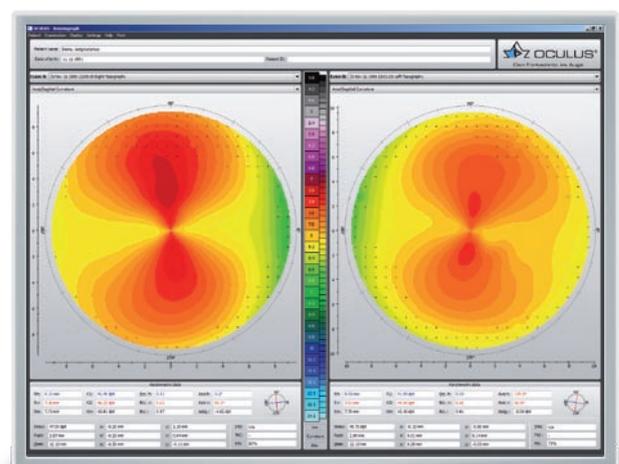
## Indices

The Indices Display facilitates quick and easy detection of topographic abnormalities. The measured values are compared with a standard database.

If keratoconus is present, it is detected at an early stage and classified according to topographic findings. The Indices Display is helpful in determining during follow-up examinations whether irregularities are changing or remaining constant.

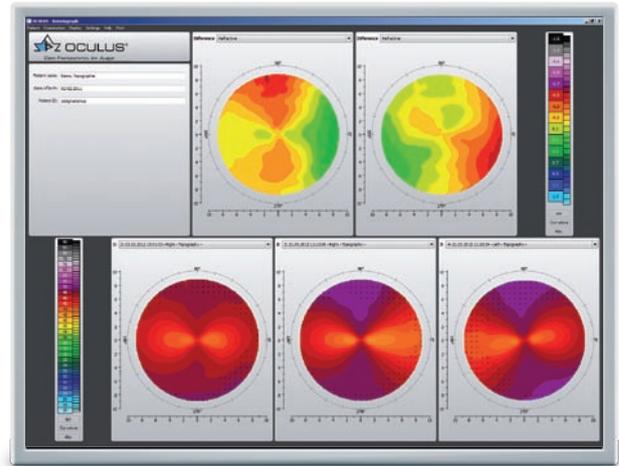
## Show 2 Exams

During follow-up examinations it is necessary to compare the results with previous exams. With this feature you can keep track of changes in corneal topography over time in contact lens wearers or patients with progressive conditions such as keratoconus.



## Compare 3 Exams

This display shows changes in corneal refraction power and allows for documentation of refractive changes brought about by refractive surgery or by wearing Ortho-K lenses.

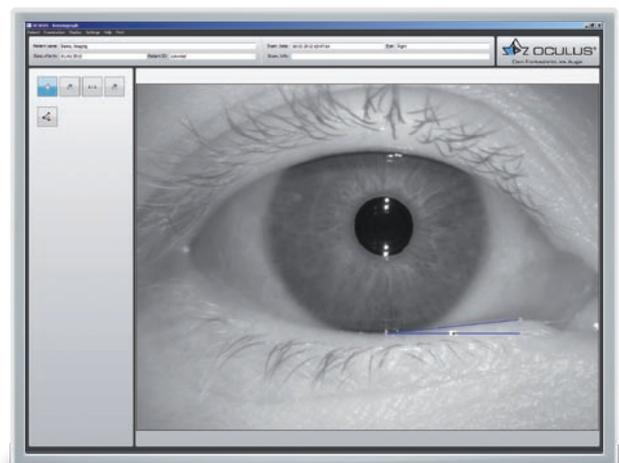


## Near Portion Height Measurement

This software simulates the near portion height of rigid bifocal contact lenses precisely, simplifying the complex fitting process.

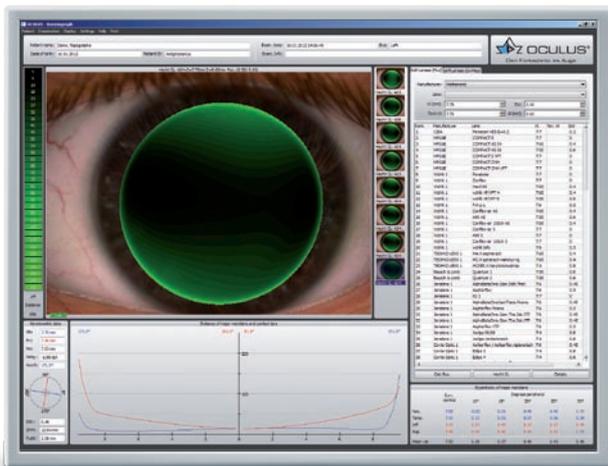
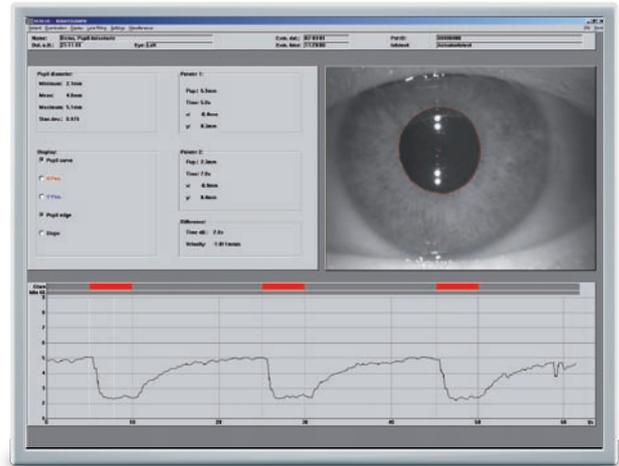
## Palpebral Angle Measurement

Measurement of the nasal lower palpebral angle facilitates identification of the expected inclination or stabilisation axis when fitting toric contact lenses. Save time and money by communicating this information to the contact lens manufacturer when you place an order.



## Pupillometry

Optional pupillometry software measures pupil reaction to light with and without glare. The reaction of both pupils can be compared to detect anisocoria.



## Contact Lens Fitting

Contact lenses are recommended on an individual basis and displayed in a list. Prior fluo image simulation can help avoid superfluous steps in fitting contact lenses. The contact lens can be rotated and moved around, tracked automatically by the simulation. The integrated and expandable database contains all customary types of contact lenses and is updated on a regular basis. The user can determine the order in which contact lens manufacturers appear.

Elegant and functional  
OCULUS Keratograph 5M with the  
Apple® iMac® and lift table  
(optional features)



# All Features at a Glance

Customise your OCULUS Keratograph 5M

Features	Keratograph 5M
TF-Scan	<input type="radio"/>
Meibo-Scan	<input type="radio"/>
Imaging	<input type="radio"/>
Pupillometry	<input type="radio"/>
OxiMap®	<input type="radio"/>

## Basic software

Topography	<input checked="" type="radio"/>
Overview Display	<input checked="" type="radio"/>
Color Map	<input checked="" type="radio"/>
3D Presentation	<input checked="" type="radio"/>
Fourier Analysis	<input checked="" type="radio"/>
Zernike Analysis	<input checked="" type="radio"/>
Indices (automatic keratoconus detection)	<input checked="" type="radio"/>
Compare 3 Exams	<input checked="" type="radio"/>
Asphericity	<input checked="" type="radio"/>
Camera Image	<input checked="" type="radio"/>
Show 2 Exams	<input checked="" type="radio"/>
Contact Lens Fitting	<input checked="" type="radio"/>
Contact Lens Database	<input checked="" type="radio"/>
Interfaces to fitting programs of various contact lens manufacturers	<input checked="" type="radio"/>
Palpebral Angle Measurement	<input checked="" type="radio"/>
Near Portion Height Measurement	<input checked="" type="radio"/>
Data import and export via USB 2.0	<input checked="" type="radio"/>

● Standard   ○ Optional

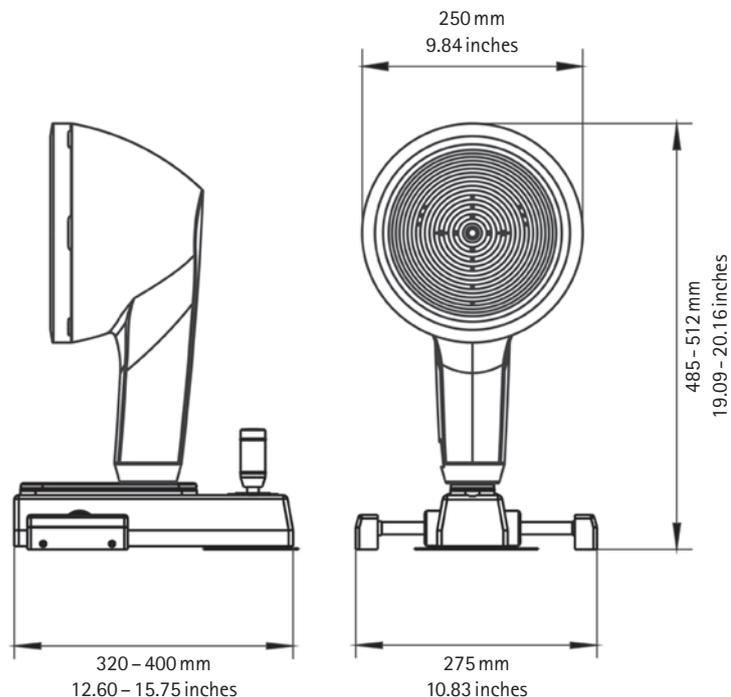
Standard and optional features may differ in your country. Contact your local OCULUS representative for details.

# Technical Data

## OCULUS Keratograph 5M

Precision	± 0.1 D	
Reproducibility	± 0.1 D	
Ring count	22	
Working distance	78 - 100 mm	
Number of evaluated data points	22,000	
Camera	Digital CCD camera	
Illumination source	Placido illumination:	white diodes
	Placido illumination:	infrared diodes (880 nm)
	Imaging illumination:	blue diodes (465 nm)
	Meibography:	infrared diodes (840 nm))
	Tear film dynamics:	white diodes
	Pupillometry illumination:	infrared diodes (880 nm)
Dimensions (WxDxH)	275 x 320 - 400 x 485 - 512 mm	
Weight	6.8 kg	
Minimal PC requirements	Processor: Intel® Core™ i3 or better, 4 GB main memory, Hard disk: 500 GB and up, graphic card: Intel HD Graphics 2000 or better, Recommended screen resolution: 1920 x 1080 (full-HD) Operating system: Windows® XP or above	
Compatibility	64 bit Windows® compatible	

CE in accordance with Medical Device Directive 93/42/EEC



WWW.OCULUS.DE

OCULUS Optikgeräte GmbH  
Postfach • 35549 Wetzlar • GERMANY  
Tel. +49-641-2005-0 • Fax +49-641-2005-295  
Email: export@oculus.de • www.oculus.de

- OCULUS USA, sales@oculususa.com
- OCULUS Asia, info@oculus.hk
- OCULUS Czechia, oculus@oculus.cz
- OCULUS Iberia, info@oculus.es
- OCULUS Poland, biuro@oculus.pl



OCULUS is certified by TÜV according to  
DIN EN ISO 13485/DIN EN ISO 9001

