The New Corvis® ST

Evaluation of corneal biomechanical response, tonometry and pachymetry.

The revolutionary Corvis® ST records the reaction of the cornea to a defined air pulse using a newly developed high-speed Scheimpflug camera (which takes over 4,300 images per second). A highly precise measurement of IOP and corneal thickness can be obtained on the basis of the Scheimpflug images it creates. A video of the 140 images taken within 31 ms after onset of the air pulse is displayed on an integrated touch screen. Based on the parameters that describe the deformation of the cornea it is possible to draw conclusions about its biomechanical properties.

Thus the Corvis® ST has the potential to provide IOP values which are independent of corneal biomechanical properties. With the new Corvis® ST and the diagnostic possibilities it opens up, OCULUS is taking completely new paths in the area of ocular diagnostics.

> Screenshot of the Corvis® ST with IOP, corneal thickness and biomechanical response parameters
Biomechanical Response

Visualisation of dynamic corneal deformation response – images you have never seen before

The high-speed camera records 140 images within 31 ms after onset of the airpulse. These 140 images provide detailed insight into corneal biomechanical response. Information about biomechanical properties can be inferred from the deformation amplitude (see image below), the 1st and 2nd applanation length and the curvature radius at the point of maximum deformation (highest concavity). Compared to a stiffer cornea with the same IOP, a softer cornea would lead to a higher deformation amplitude but a shorter applanation length and a smaller radius of curvature. These parameters of corneal deformation open up completely new doors in the field of corneal biomechanics.

Measurement Features of the Corvis® ST

- Deformation amplitude
- Applanation length
- Corneal velocity
- IOP measurement
- Corneal thickness
- Scheimpflug images of 1st and 2nd applanation and of the highest concavity of the cornea
- Slow-motion video of the corneal deformation after air pulse
IOP and Pachymetry

Measurement of IOP and corneal thickness reaches new level of precision

IOP Measurement Mode

The new measuring technique uses an ultra-high-speed Scheimpflug camera in combination with an air pulse to determine IOP values with great precision. Initial studies have confirmed its high degree of reproducibility in comparison to that obtained by Goldmann applanation tonometry and non-contact tonometry\(^1\). The measurement principle employed here ensures results uninfluenced by such factors as insufficient tear film or patient positioning. Automatic release and specified measurement quality guarantee user-independent data. Up to 6 measurements can be taken, and the average IOP is printed out or displayed. IOP measurements can be corrected with the aid of pachymetry-based correction tables including the Dresden correction table and the new Spoerl correction table, which takes patient age into account.

Pachymetry Mode

An integrated Scheimpflug camera enables the Corvis® ST to take precise measurements of corneal thickness. Integrated correction tables (Dresden, Ehlers, etc.) also allow for correction of IOP measurements according to central corneal thickness. Additionally, the Corvis® ST determines corneal thickness along the horizontal sectional plane including minimal corneal thickness.

Unique Features, Multiple Applications

Applications

Determine the true IOP
- The Corvis® ST measures IOP, corneal thickness and the deformation response of the cornea.
- Based on these data it has the potential to determine an IOP value that is uninfluenced by corneal biomechanical properties.

Screening for corneal ectasia
- Corneal ectasia lead to changes in the viscoelastic properties of the cornea.
- These changes can be analyzed based on deviations in deformation response parameters relative to normal eyes.

Visualizing the effect of corneal crosslinking
- Changes in deformation characteristics due to corneal crosslinking can also be measured with the Corvis® ST.
- The Corvis® ST has the potential to quantify the effect of crosslinking on the biomechanical properties of the cornea.

High-speed Scheimpflug images – A quantum leap in ocular diagnostics
# Technical Data
## OCULUS Corvis® ST

### Tonometer
- **Measurement range**: 6–60 mmHg
- **Measurement distance**: 11 mm (0.4 in)
- **Inner fixation light**: Red LED

### Scheimpflug camera
- **Frame rate**: 4,330 images per sec
- **Measurement range**: 8.5 mm (0.3 in) horizontal coverage
- **Pachymeter measurement range**: 200–1,200 μm
- **Measuring points**: 576 per image (80,640 per examination)
- **Source of light**: Blue LED (470nm UV free)

### Technical specifications
- **Dimensions (W x D x H)**: 270 x 520 x 495–520 mm (10.7 x 20.5 x 19.5–20.5 in)
- **Weight**: 14 kg (30.8 lbs)
- **Max. power consumption**: 49.5 W
- **Voltage**: 110/220 VAC
- **Frequency**: 50–60 Hz

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*In accordance with Medical Device Directive 93/42/EEC*
OCULUS | Corvis® ST
Corneal Visualization
Scheimpflug Technology

We focus on progress