Chronos

Automated Binocular Refraction System

The **All-In-One***, Automated Binocular Refraction System with SightPilot Guided Refraction Algorithm.

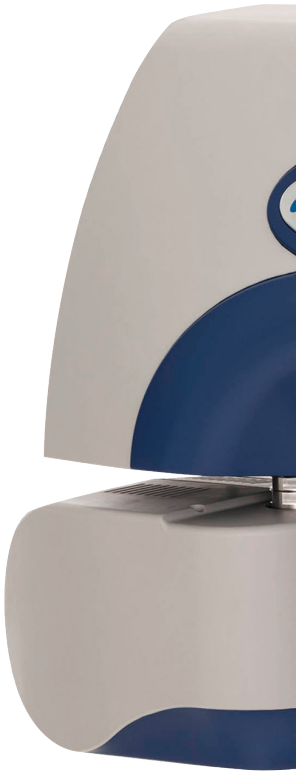
Reinvent Refraction.

*All-in-one system combines binocular autorefraction and keratometry with subjective binocular testing and visual acuity.

TOPCON Healthcare

SEEING EYE HEALTH DIFFERENTLY

Topcon Chronos is an all-in-one* digital refraction solution



Topcon Chronos combines autorefraction, keratometry and subjective refraction in a single device that takes up less than 4 feet of space.

The fully automated system, which features SightPilot® guided refraction software, enables easy operation, and binocular testing means refractions take less time than traditional methods, allowing you to see more patients and grow your practice.

Chronos can be controlled wirelessly from a tablet, laptop or desktop PC, allowing operation from a safe distance.

*All-in-one system combines binocular autorefraction and keratometry with subjective binocular testing and visual acuity.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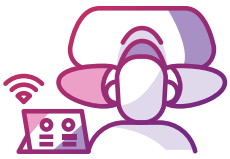
Features and Benefits

SAVE TIME

Binocular testing and a built-in autorefractor that pre-sets the subjective refraction streamlines the process.

SAVE SPACE

Chronos combines an autorefractometer, a keratometer, phoropter and acuity testing chart into a single instrument with a compact footprint.



DELEGATE

Fully automated system with touchscreen tablet control auto-aligns and captures both the objective measurement and subjective refraction.

SightPilot software guides the operator through the entire process enabling refractions to be delegated to other technicians.

GROW

Perform more refractions without adding exam lanes or trained technicians.

ACCOMMODATE PATIENTS

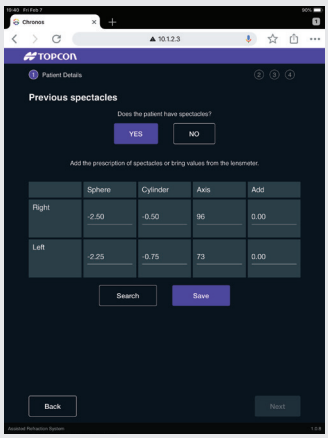
Multi-function capabilities allow patients to complete the exam without moving to multiple instruments.

Simplify refraction

SightPilot software guides operators through the refraction process with a simple user interface and on-screen prompts.

Questions for the patient are given to the operator at each step, and the patient's response prompts the next step in the guided refraction process.

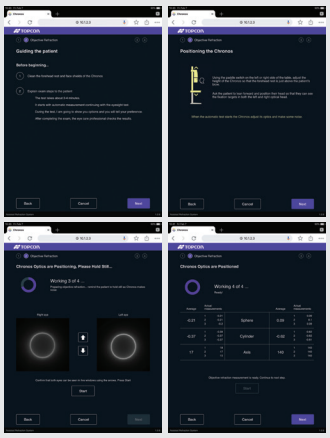
1



Patient Details

Enter the patient information including previous spectacle prescription to begin the refraction.

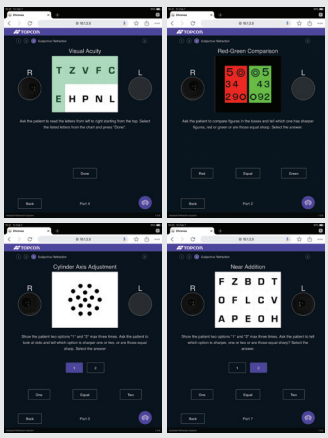
2



Objective Refraction

Chronos provides step-by-step instructions to guide and position the patient for the objective refraction and then automatically aligns the optics to complete the objective refraction.

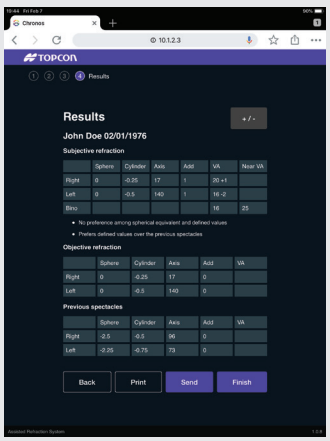
3



Subjective Refraction

Chronos walks the operator through a variety of subjective refractions tests including visual acuity charts, red-green comparison, cylinder axis adjustment, binocular balancing and near addition charts. On-screen prompts enable quick input of patient response to advance to the next step in the process.

4



Results

When the refraction is complete, the results are displayed on screen and may be printed or sent to the patient's EHR file.

Specifications

Objective Refraction		
Refraction Measurement Range	Spherical Refractive Power	–25D to +22D[1]
	Cylindrical Refractive Power	-10D to 0D[1]
	Cylinder Axial Angle	1° to 180°
Minimum Measurement Unit	Spherical/Cylindrical Refractive Power	0.12D
	Cylinder Axial Angle	1°
Corneal Curvature Measurement Range	Corneal Curvature Radius	5.00mm to 10.00mm
	Corneal Refractive Power	67.50D to 33.75D (Conversion value when the corneal refractive ratio is 1.3375)
Minimum Measurement Unit	Corneal Curvature Radius	0.01mm
	Corneal Refractive Power	0.12D
Minimum Measurable Pupil Diameter	ø 2.0mm	
PD Measurement Range	50mm – 80mm in 0.5mm steps	

[1] The dioptric powers are indicated with reference wavelength Đe = 546.07 nm

Subjective Refraction		
Spherical Power	Measuring Range	–18D to +18D[2]
	Measuring Step	0.25D
Cylinder Power[4]	Measuring Range	-8D to 0D[3] 1° to 180°
	Measuring Step	0.25D
	Cylinder Axial Angle	1°
Prism	Horizontal Prism One Eye Movable Range	±15.0Δ[5]
	Vertical Prism One Eye Movable Range	±2.5Δ
	Prism Refractive Power	0.1Δ
Visual Acuity Measurement Range[6]	0.05 – 1.6 decimal	
Test Distance	Far-/Near-point test distance can be set between 10in and 20ft/25cm and 6.096cm	
Charts	Visual acuity charts, spherical power correction charts, astigmatism correction charts and binocular function charts	
Background Luminance	155315cd/m^2	
Display of Measured Value	Displayed on the screen of the operation controller	
Record of Measured Value	Printing by thermal printer/external printer, data output	
Measuring Head Movement	Right-and-left direction	Inside -9.0mm to outside +12.5mm
	Up-and-down direction	Down 15mm to up 15mm
	Back-and-forth direction	Forward 20mm to backward 20mm
Measuring Head Rotary Angle	Convergence 17.5° to divergence 8.5° (eyeball torsion axis center)	
Power Supply	AC100 – 240V 50-60Hz	
Power Consumption	160VA	
Markings	CE, CSA	

[2] The conversion value with "VD=12mm" is described here.
[3] The conversion value with the pupil power (VD=-3mm) is described here.
[4] The value described here is the maximum value. The measurement range is smaller according to the test distance setting for executing a test or the setting conditions of VD during measurement.
[5] The value described here is the maximum value. The measurable range is smaller according to the combination of the patient's PD and the test distance.
[6] 0.1 – 1.6 complies with ISO 10938. ETDRS chart using Landolt Ring (visual acuity 0.25 – 1.6) complies with ANSI Z80.21.

Dimensions & Weight	
Main Unit	Dimensions 20.7in (H) x 28.4in (W) x 10.9in (D)/526mm (H) x 722mm (W) x 277mm (D) Weight 68.8 pounds/31.2 kg
Power Supply Unit	Dimensions 10.9in (H) x 4.6in (W) x 7.8in (D)/276mm (H) x 117mm (W) x 197mm (D) Weight 7.7 pounds/3.5 kg

IMPORTANT In order to obtain the best results with this instrument, please be sure to review all user instructions prior to operation.

 MCA #4231

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