

# Chronos\*

Optimize workflow and grow your practice  
with guided binocular refraction.



**It is time**  
to reinvent  
refraction.

 **TOPCON** Healthcare

SEEING EYE HEALTH DIFFERENTLY

---

REFRACTION SYSTEM

# Chronos

Single instrument that occupies a minimal amount of space and optimizes workflow

Chronos offers binocular autorefractometry, keratometry measurements and visual acuity with subjective testing in a single instrument.

Moving between measurements and setting the testing distance are no longer needed.



# 7 Value Propositions Only Possible with Chronos<sup>\*1</sup>



## Binocular Objective Testing

Chronos offers simultaneous measurement of binocular autorefraction and keratometry.



## Binocular Subjective Refraction

Visual acuity can be measured with both eyes opened, which generates the data for binocular vision.



## Seamless Testing

Testing is available with multiple distances and can be adjusted depending on the patient's needs.



## Unique Operability<sup>\*2</sup>

Guided refraction system, SightPilot™, facilitates the exam simply by tapping buttons based on the patient's response.



## Time Saving

Exam time can be reduced and workflow optimized by removing the need to move patients between instruments.



## Tablet Control

All steps for objective and subjective refraction, including distance and near vision testing, can be done on a tablet while maintaining social distance.



## Space Saving

3 measurements<sup>\*3</sup> are available in 1 instrument, which occupies only 120cm of depth<sup>\*4</sup>.

<sup>\*1</sup> Only applicable with all the functions enabled. (Research done by Topcon Corporation as of October 2021)

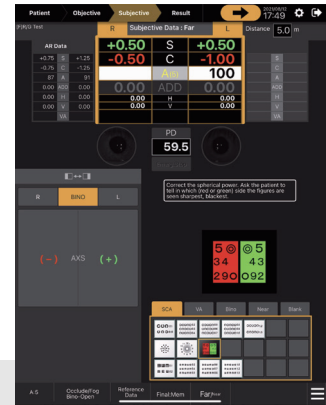
<sup>\*2</sup> Compared with our conventional devices.

<sup>\*3</sup> Binocular autorefraction, keratometry measurements and visual acuity with subjective testing

<sup>\*4</sup> The depth varies depending on the size of the chair and wheelchair.

## Standard Mode

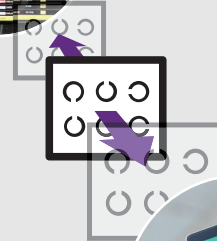
Equipped with a user interface similar to that of a conventional refractor<sup>\*1</sup>, you can perform the exam following familiar operations. Visual acuity, astigmatism, and binocular visual function tests can be completed without hassle.



## Seamless Testing

Testing distance\* can be selected seamlessly, and the visual acuity test can be customized based on the patient's needs.

\*The testing distance can be selected from 6 to 25cm.



## Seamless Vision Comparison

Lens switching is now faster than a conventional refractor. Vision comparison can be done smoothly between measured refractive data, current glasses power, and corrected power after subjective test.

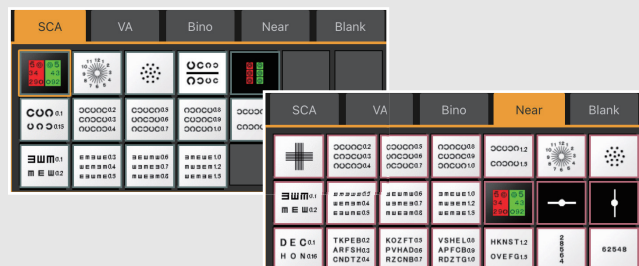


## Variety of Charts

Chronos is equipped with various styles of charts including for both distance and near visual acuity tests.

It is easy to switch between charts, and those that are frequently used can be stored under the same tab for seamless access.

The red-green, astigmatism and binocular tests are also available for near visual acuity testing.



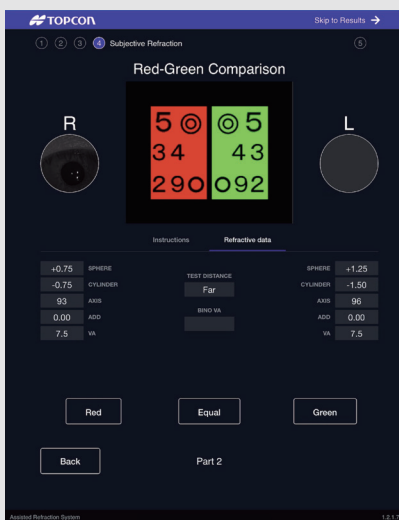
\*1 Compu Vision CV-5000

# Testing Modes for Your Needs

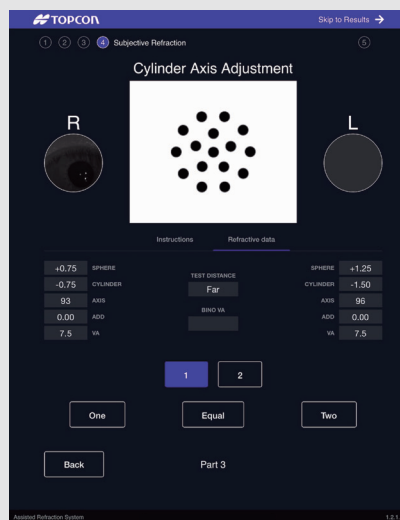
Standard Mode / SightPilot™

## Guided Refraction System - SightPilot™

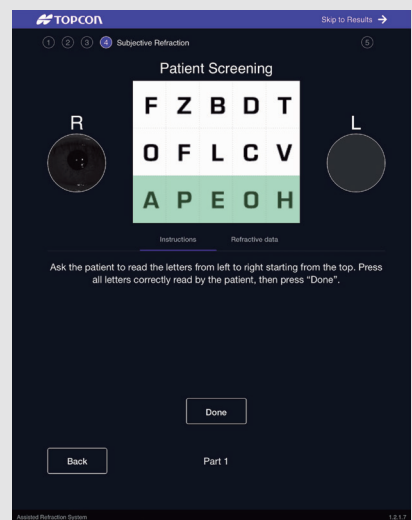
Exam workflow has been simplified by applying our unique algorithm. Simply tapping buttons based on the patient's response allows you to proceed the subjective refraction testing.



**Red-Green Test**  
Simply tap either  
"Red", "Green" or "Equal"



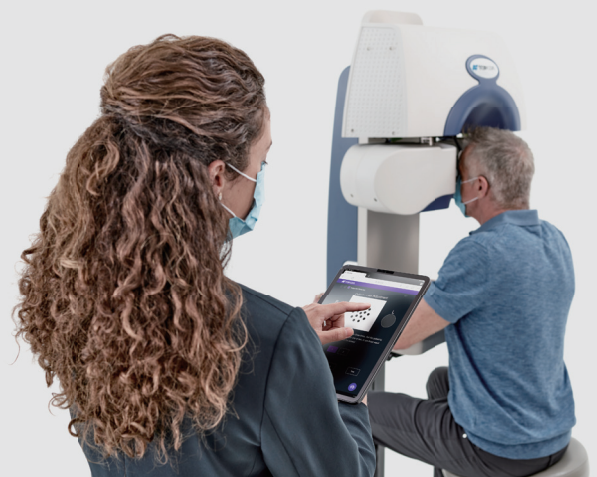
**Astigmatism Test**  
Simply tap either  
"One", "Two" or "Equal"



**Visual Acuity Test**  
Visual acuity test can be measured  
and recorded simply by tapping the letters  
that the patient recognizes.

## Smooth Exam Transition

Subjective refraction can be started with the refractive and keratometry data gained from the binocular test automatically.



Chronos is an all-in-one instrument offering autorefractometer, phoropter and vision charts.

Smooth measurement is possible for patients with special access needs without moving between instruments.

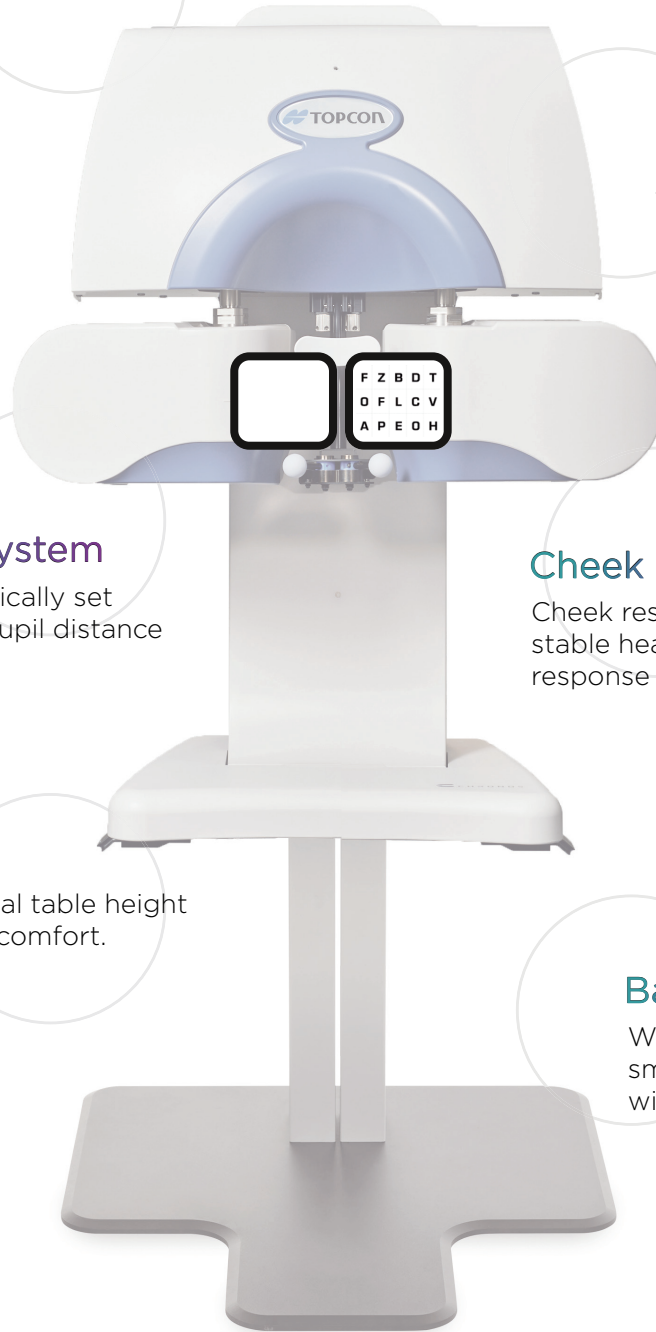


## Refractive and Keratometry Measurement

Binocular refractive and keratometry measurements are quickly taken by tapping the auto-align camera launcher button.



The patient's eyes are displayed live on the tablet throughout the exam, enabling the operator to check the patient's status from a distance.



## Binocular Testing

The measurement can be done under binocular vision for more natural sight.

## Built-In Testing System

Convergence is automatically set based on the patient's pupil distance for near vision testing.

## Cheek Rest

Cheek rest is equipped to realize the stable head position and the ease of response during the subjective test.

## Table

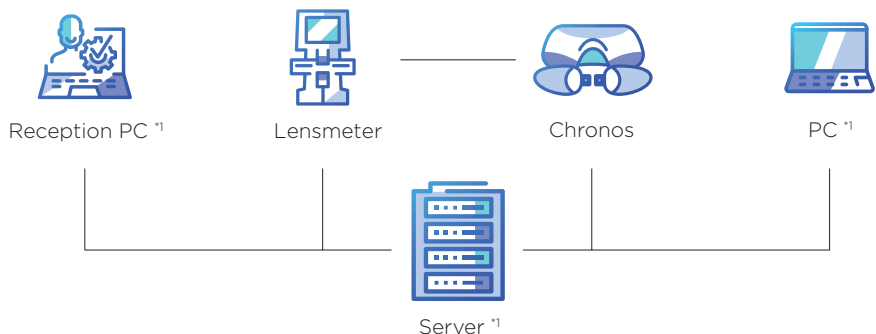
Adjustable vertical table height for the patient's comfort.

## Base

Wheelchair accessible for smooth testing of patients with special needs.

## System Integration

Chronos can be integrated with lensmeter and other external software for seamless data transfer.



\*1 Third-party hardware

## SPECIFICATIONS & PERFORMANCE

FEATURE	SPECIFICATION	
<b>Objective measurement</b>		
<b>Refraction measurement range</b>	Spherical refractive power	-25D - +22D <sup>1</sup>
	Cylindrical refractive power	0D - -10D <sup>1</sup>
	Cylinder axial angle	1° - 180°
<b>Corneal curvature measurement range</b>	Corneal curvature radius	5.00mm - 10.00mm
	Corneal refractive power	67.50D - 33.75D (Conversion value when the corneal refractive ratio is 1.3375)
<b>Minimum measurement unit</b>	Spherical/cylindrical refractive power	0.12D
	Cylinder axial angle	1°
	Corneal curvature radius	0.01mm
	Corneal refractive power	0.12D
<b>Display of measured value</b>	Displayed on the screen of the operation controller	
<b>Minimum measurable pupil diameter</b>	φ2.0mm	
<b>PD measurement range</b>	50mm - 80mm	
<b>Minimum PD measurement unit</b>	0.5mm	
<b>Subjective measurement</b>		
<b>Refraction measurement range</b>	Spherical power/ADD/ Cylindrical power These must meet all the conditions mentioned at the right <sup>4</sup>	-18.00D ≤ Equivalent spherical power ≤ +18.00D <sup>2</sup> -8.00D ≤ Cylindrical power ≤ 0.00D <sup>3</sup>
	Cylinder axial angle	1° - 180°
	Horizontal prism (One eye movable range)	±15.0 Δ <sup>5</sup>
	Vertical prism (One eye movable range)	±2.5 Δ
	<b>Minimum measurement unit</b>	Spherical/ADD refractive power
	Cylindrical refractive power	0.25D
	Cylinder axial angle	1°
	Prism refractive power	0.1 Δ
<b>Test distance</b>	Far-/Near-point test distance can be set between 25cm and 6.096m	
<b>Visual acuity measurement range<sup>6</sup></b>	0.05 - 1.6 decimal	
<b>Charts</b>	Visual acuity charts, spherical power correction charts, astigmatism correction charts and binocular function charts	
<b>Background luminance</b>	155±15cd/m <sup>2</sup>	
<b>Display of measured value</b>	Displayed on the screen of the operation controller	
<b>Record of measured value</b>	Printing by thermal printer/external printer, data output	
<b>Measuring head movement</b>	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 - Backward: 20mm
<b>Measuring head rotary angle</b>	Convergence 17.5° to Divergence 8.5° (Eyeball torsion axis center)	
<b>Power supply</b>	AC100 - 240V 50-60Hz	
<b>Power consumption</b>	160VA	
<b>Dimensions and weight (main unit)</b>	525mm (H) × 722mm (W) × 278mm (D), 31.2kg	

\*Not available in all countries. Please check with your local distributor for availability in your country.

1. The dioptric powers are indicated with reference wavelength λe = 546.07 nm

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.

### IMPORTANT

Subject to change in design and/or specifications without advanced notice. In order to obtain the best results with this instrument, please be sure to review all user instructions prior to operation. Medical device MDD Class Im. Manufacturer: Topcon Corporation.



### TOPCON CORPORATION

75-1 Hasunuma-cho, Itabashi-ku, Tokyo 174-8580, JAPAN. Phone: +81-(0)3-3558-2522/2502 Fax: +81-(0)3-3965-6898 [www.topconhealthcare.jp](http://www.topconhealthcare.jp)

### TOPCON SINGAPORE MEDICAL PTE. LTD.

100G Pasir Panjang Road, #05-05, Interlocal Centre, SINGAPORE 118523  
Phone: +65-68720606 Fax: +65-67736150  
E-mail: [med.sales.sg@topcon.com](mailto:med.sales.sg@topcon.com)  
[www.topconhealthcare.sg](http://www.topconhealthcare.sg)

### TOPCON INSTRUMENTS (MALAYSIA) SDN. BHD.

No.6, Jalan Penscharah UI/28, Hicom Glenmarie Industrial Park, 40150 Shah Alam, Selangor, MALAYSIA  
Phone: +60-(0)3-50223688 Fax: +60-(0)3-50313968  
E-mail: [mys\\_medical\\_sales@topcon.com](mailto:mys_medical_sales@topcon.com)  
[www.topconhealthcare.my](http://www.topconhealthcare.my)

### TOPCON INSTRUMENTS (THAILAND) CO., LTD.

77/162 Sinnsathorn Tower, 37th Floor, Krungthongburi Rd., Klongtonnai, Klongsarn, Bangkok 10600, THAILAND  
Phone: +66(0)2-440-1152-7 Fax: +66-(0)2-440-1158  
E-mail: [tha\\_medical@topcon.com](mailto:tha_medical@topcon.com)  
[www.eyecare.topcon.co.th](http://www.eyecare.topcon.co.th)

### MEHRA EYETECH PRIVATE LIMITED

801 B Wing, Lotus Corporate Park, Graham Firth Steel Compound Goregaon (East) Mumbai 400063 Maharashtra, INDIA  
Phone: +91-22-61285455  
E-mail: [sales@mehraeyetech.in](mailto:sales@mehraeyetech.in)  
[www.topconhealthcare.in](http://www.topconhealthcare.in)

### TOPCON (BEIJING) MEDICAL TECHNOLOGY CO., LTD.

Room 2808, Tower C, JinChangAn Building, No.82, Middle Section of East 4th Ring Road, Chaoyang District, Beijing 100124, P.R. CHINA  
Phone: +86-10-8794-5176

**TOPCON Healthcare**

SEEING EYE HEALTH DIFFERENTLY

M000012A-2