

CHAROPS

PRODUCT MANUAL

CHAROPS



Charops Is The World'S Leading Eye-Care Expert
That Drives Customer Success.

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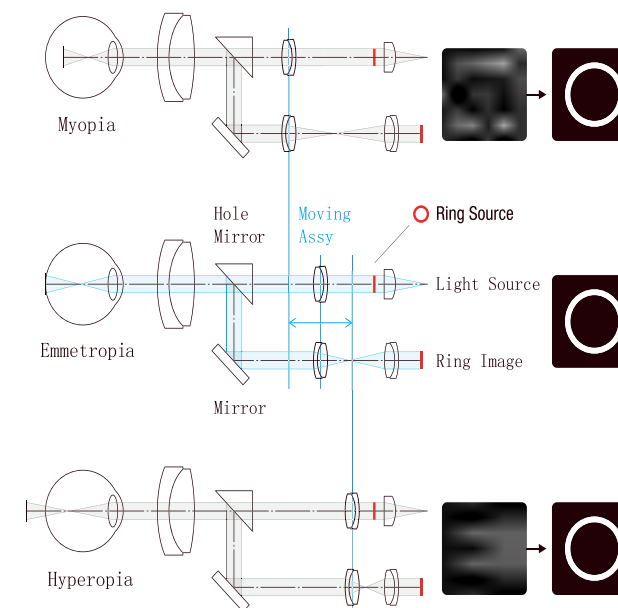


CR-1/CRK-1/CR-1P/CRK-1P

Auto Ref-Ker

Smart Assembly Moving Control Technology

The advanced technology behind the REF optical system is evidenced by the exceptional accuracy and stability of its measurement results. By accounting for the patient's refractive error, the measurement ring is projected onto the retina and automatically adjusted via Smart Assembly to ensure a stable signal. The CRK minimizes the effects of uneven light reflection in both healthy and cataractous eyes, resulting in more accurate refractive power (REF) data.

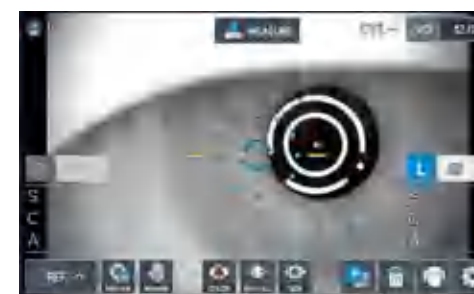


Smart Assembly Moving Control(SAMC) Tech



Quick Virtual Aiming Dot Function

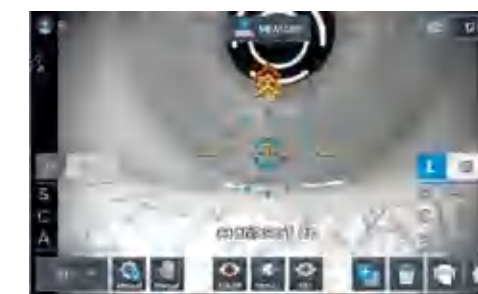
The Aiming Dot efficiently guides the operator to the patient's visual apex from any position, ensuring rapid alignment and the automatic acquisition of reliable refractive power (REF) data.



Aiming Dot

Simple up & down Auto Tracking

The Auto Tracking feature automatically tracks the patient's eye, facilitating measurement. The joystick can simply be moved back and forth without rotation.



Chinrest Adjustment

Intuitive Iris, measurement of pupil size

With the image capture function, the iris and pupil diameter can be measured up to 14mm, and REF measurement can be performed with a pupil diameter as small as 2mm.



Iris and Pupil Diameter Measurement

Immediate Color View Mode

The full-color camera and white LED light are used for color display, overall condition monitoring, contact lens fitting, and prescription



Color View Mode

Clear Retro-Illumination Mode

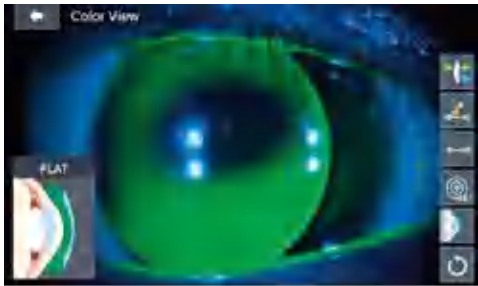
The device allows for the observation of eye health and condition, including the detection of lens opacity or corneal damage. It simultaneously generates the SPH, CYL, and AXIS data required for precise eyeglass and contact lens prescriptions.



Retro-Illumination Mode

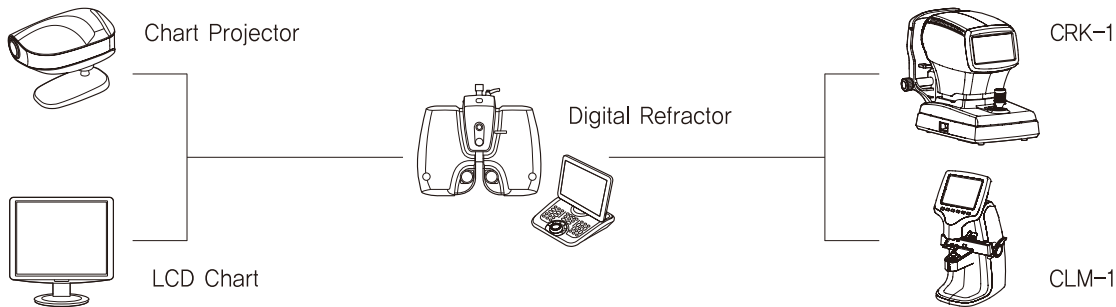
Contact Lens fitting Assistance Guide

Image processing, aided by a fluorescence solution and yellow filter, automatically determines the fitting state.



Contact Lens fitting Assistance Guide

System Networking



SPECIFICATIONS

			CR-1	CRK-1	CR-1P	CRK-1P
Measurement Mode	K/R Mode	Continuous Keratometry & Refractometry	×	○	×	○
	REF Mode	Refractometry	○	○	○	○
	KER Mode	Keratometry	×	○	×	○
	Retro-ILL	Retro-illumination	×	×	○	○
	Color View Mode	Color View &Contact Lens Fitting Assistance (White &Blue LED Light)	×	×	○	○
Refractometry	Vertex Distance(VD)	0.0,12.0,13.75,15.0	○	○	○	○
	Sphere(SPH)	-30.00~+25.00D(VD=12mm) (Increments:0.01,0.12,0.25D)				
	Cylinder(CYL)	0.00~±12.00D(Increments :0.01,0.12,0.25D)				
	Axis(AX)	0~180° (1° unit)				
	Astigmatism Indication	-,+,±Mixed				
	Pupil Distance(PD)	10~85m				
	Minimum Pupil Diameter	Ø2.0mm				
Keratometry	Radius of Curvature	5.0~13.0mm(Increments :0.01m)	×	○	×	○
	Cornea Power	25.96D~67.50D(Increments :0.05,0.12,0.25D) When cornea equivalent refractive index is 1.3375				
	Cornea Astigmatism	0.00~15.00D(Increments :0.05,0.12,0.25D)				
	Axis	0~180° (Increments :1°)				
	Pupil,Iris Diameter	2.0~14.0mm(Increments:0.1mm)				
	Memory of Data	10 measurements for each eye				
Auto Tracking Distance	Up and down	±15mm	×	×	○	○
Others	Display	7 inch Wide Color TFT LCD Resistive Touch Panel	/			
	Interface	RS-232C				
	Internal Printer	Thermal Line Printer				
	Power Supply	100-240VAC,1.0-0.6A,50/60Hz				
	Dimensions /Weight	261(W)X 513(D)X 433(H)mm/16kg				

Designs and details can be changed without prior notice for the purposes of improvement.



CRK-8800

Auto Ref-Ker

For high-precision ocular measurement, Huvitz Wavefront Technology is the ideal solution.

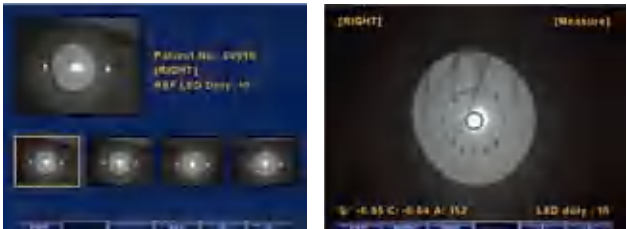
Unlike many conventional diagnostic devices, CRK-8800 utilizes the Hartmann-Shack wavefront sensor, which can analyze multiple focal spots of a light wave. This technology unlocks new possibilities for precise ocular error diagnosis.

Optimized Optical System

HUVITZ's MICRO LENSLET ARRAY generates numerous separate focal spots, providing valuable insights into the customer's ocular system. Additionally, the use of a Super Luminescent Diode (SLD) and a highly sensitive CCD ensures clearer imaging and more accurate measurements for ametropia, cataracts, and IOLs.

Retro-Illumination Mode

Retro-illumination mode enables the observation of abnormalities such as crystalline lens issues, cataracts, and corneal scratches, aiding in the assessment of the customer's eye health. With increased REF power, it also allows for SPH, CYL, and AXIS measurements that cannot be detected in normal mode.



IOL Measuring Mode

The CRK-8800 automatically assesses eye conditions to detect and measure IOLs or cataracts.

Pupil and Iris Size Measurements

The CRK-8800 can measure the size of the pupil, cornea, and iris for diameters under 14mm by freezing the image.

Realization of a Total Refraction System

The CRK-8800 can connect with other devices, such as the Charops Digital Refractor and the Lensmeter, for faster and more accurate data retrieval.

SPECIFICATIONS

Measurement Mode

K/R Mode	Continuous Keratometry & Refractometry
REF Mode	Refractometry
KER Mode	Keratometry
SIZE Mode	Pupil 8 Iris Size

Refractometry

Vertex Distance(VD)	0.0,12.0,13.5,15.0mm
Sphere(SPH)	-25.00D ~ +22.00D (When VD=12mm) (Increments:0.12D & 0.25D)
Cylinder(CYL)	0.00~±10D(increments:0.12D & 0.25D)
Axis(AX)	1 ~ 180(Increments:1°)
Cylinder Form	-,+,±
Pupil Distance	10 ~ 85mm
Minimum Pupil Diameter	Ø2.0mm

Keratometry

Radius of Curvature	5 ~ 10.2mm(Increments:0.01mm)
Corneal Power	33.00D ~ 67.50D (When Index=1.3375) (Increments:0.05D/0.12D/0.25D)
Corneal Astigmatism	0.00 ~ -15.00D (Increments:0.05D/0.12D/0.25D)
Axis (AX)	1°~ 180° (Increments:1°)
Pupil,Iris Diameter	2.0 ~ 14.0mm(Increments:0.1mm)
Memory of Data	10 measurements for each eye

Others

Internal Printer	Thermal Line Printer
Power Saving	Automatic switch-off(5min)
Display	5.7inch Color TFT LCD
Power Supply	AC100~240V,50/60Hz(Free Voltage)60W
Dimension	252(W)x 500(D)x432(H)mm/20kg

Designs and details can be changed without prior notice for improvements



CRK-8100A

Auto Ref-Keratometer

Personalized vision correction with HRK-8100A

Applied to Wavefront Technology

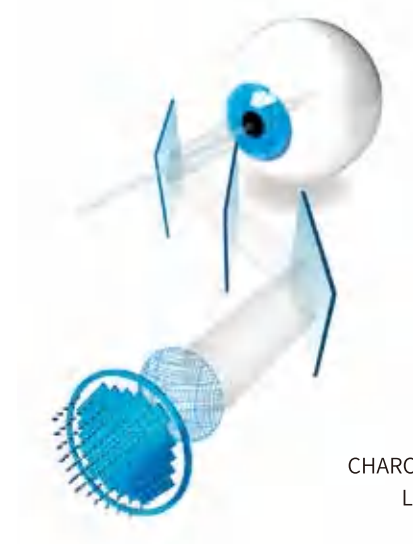
The independently developed CHAROPS Micro Lens Array consists of hundreds of tiny lenses, providing a high density of data points for the precise diagnosis of refractive errors.

MICRO LENS ARRAY

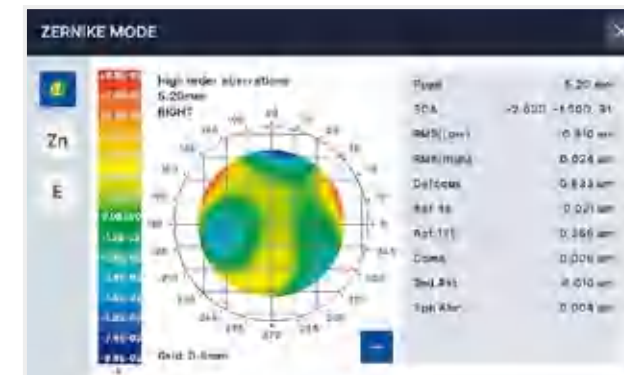
CHAROPS' proprietary micro lens array generates multiple distinct focal spots. The resulting pattern provides valuable information about the customer's ocular system, enabling precise measurement and analysis of ocular characteristics.

PSF & IMAGE SIMULATION

In addition to conventional data (Sphere, Cylinder, and Axis), high-order aberration data is displayed in a graphical Zernike map. This provides a clearer understanding of the patient's ocular health and supports superior clinical decision-making.



CHAROPS Micro
Lens Array



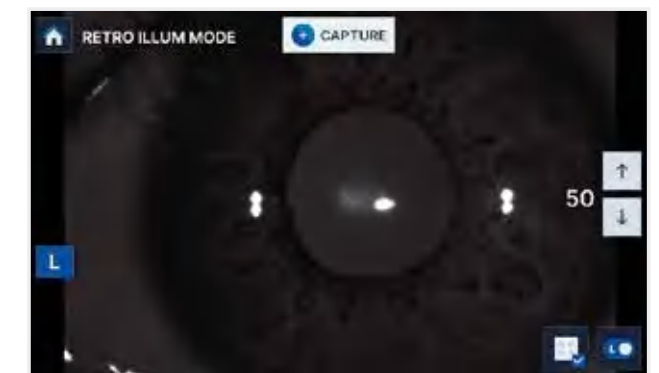
ABERRATION MAP



PSF & IMAGE SIMULATION

Optimized Optical System IOL, RET-ILLUM MODE

Applied the separate measurement method for intraocular lens or Cataract measurement, Our product HRK-8100A is available to observe the condition of eye health such as the cataract patient with lenticular opacity or cornea injury caused by wearing contact lenses.



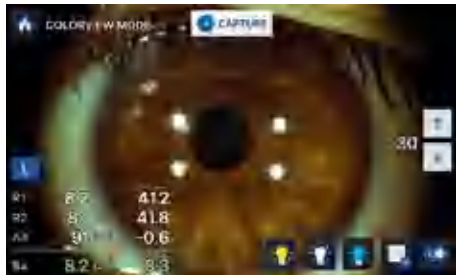
Optimized Optical System
IOL, RET-ILLUM MODE

COLOR VIEW MODE

The full-color CCD camera and white LED light source in the auto ref-keratometer allow assessment of contact lens fitting status, which was previously only possible using slit lamps.

Iris, Pupillometry measurement

The image capture function measures iris and pupil diameters ranging from 2 mm to 14 mm.



COLOR VIEW MODE

Fitting for Contact Lens with the ASSISTANCE GUIDE

The world's first contact lens fitting function integrated into an auto ref-keratometer enables visualization of fluorescein liquid under blue illumination. The CRK-8100A also analyzes and simulates lens fitting status through automatic calculation and recommendation.



ASISTANCE GUIDE

Auto Tracking

The advanced auto sensor and three-dimensional movement mechanism automatically track the eye's measurement focus, enabling accurate measurements even for inexperienced users.



Output at External Monitor

Auto Chin Rest

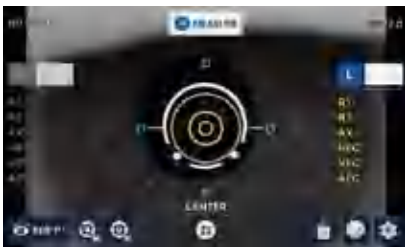
By pressing the Up and Down buttons, users can easily and quickly adjust the height of the measuring point for optimal comfort.

Quiet & Speedy Auto Cutting Printer

Automatic paper cutting and one-touch paper roll replacement enhance the convenience and efficiency of the CRK-8100A.

Effective virtual vision acuity comparison function

The built-in chart enables comparison between current visual acuity and corrected visual acuity.



AUTO TRACKING GUIDE



Auto Cutting Printer

SPECIFICATION

Measurement Mode

Continuous Keratometry & Refractometry (K/R Mode)

Refractometry (REF Mode), Keratometry (KER Mode)

Refractometry

Vertex Distance(VD)	0.0,12,13.5,15.0
SPH	-20.00~+20.00D (In case of VD=12 mm)(0.01/0.12/0.25D Unit)
CYL	0.00~±12.00D(0.01/0.12/0.25D Unit)
Axis(AX)	0~180° (1° Unit)
Cylinder Form	-, +, MI IX
Pupil Distance(PD)	10~85mm
Minimum pupil diameter	Ø 2.0mm

Keratometry

Radius of Curvature	5.0~13.0mm(0.01mm Unit)
Corneal Power	25.96~67.50D(In case that the corneal equivalent refractive power is 1.3375, 0.05/0.12/0.25D Unit)
Corneal Astigmatism	0.0~-15.00D (Increments: 0.05/0.12/0.25D)
Axis	0~180° (1° Unit)
Corneal diameter	2.0~14.0mm(0.1mm Unit)

Auto travel distance

Up & Down	15mm(±3mm)
Right & Left	5mm(±2mm)
Back & Forth	5mm(±2mm)

Automatic tracking scope

Up & Down	5mm(±2mm)
Right & Left	5mm(±2mm)
Back & Forth	5mm(±2mm)

Chin rest travel distance

Up & Down	60mm(±3mm)
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Data Storage

Measured value of ten(10) times amount for each left/right eye

Hardware specification

Built-in printer	Line printer of heat printing type /Auto cutting
Power saving function	As stopping to measure for about 3/5/10 minutes, the main power is shut. It returns as pushing buttons.
Monitor	7.0" TFT LCD with touch screen
Electrical Power	AC100~240V, 50/60 Hz
Current	1.0-0.8A

*Specification and design are subject to change without notice.





CVS-1

Vision Screener

CVS-1

Rapid Vision Screening for Infants and Toddlers, in Less Than a Second! Enhanced Accuracy with Higher Light Intensity

Our device provides quick and accurate measurements for everyone from infants over six months old—who may be restless in front of a desktop autorefractometer—to adults with limited mobility.



Quick and Comfortable Measurement

Non-contact measuring in one go

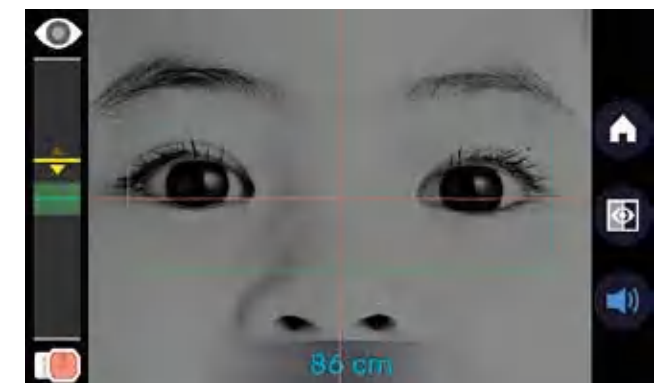
Measures refractive abnormalities such as myopia, astigmatism, hyperopia, and strabismus within one second from a distance of 1 meter, similar to taking a photograph. Infants can be measured while being held by a guardian, and elderly patients with mobility issues can be tested comfortably without the need for repositioning.

Minimized shaking during measurement

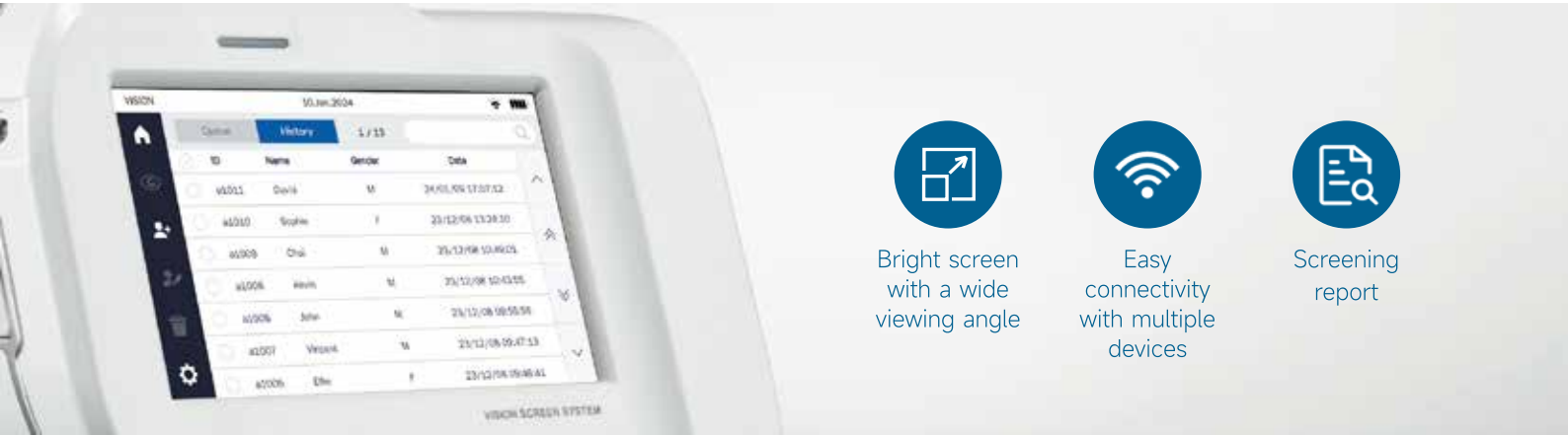
A global camera sensor minimizes image shake during the rapid measurement process.

Child-friendly measurement method

Attracts the child's attention and guides their gaze using light and sound, helping them focus on the center of the vision screener.



Measurement Screen



Bright screen
with a wide
viewing angle



Easy
connectivity
with multiple
devices



Screening
report

Reliable Test Results

Accurate measurement with Focus LED technology

Precisely measures the eye while minimizing ambient light interference using patented Focus LED technology.
*Use in a dark environment is recommended for improved data accuracy.

Enhanced measurement precision

High-resolution camera and advanced optometric measurement algorithms using a quad-core CPU provide more precise optometric data.

Trustworthy analysis results

Offers reliable analysis by evaluating the reflection of light from the retina, identifying refractive errors and ocular alignment abnormalities.



Result Screen

User-Centered Convenience

Clear, wide-angle IPS monitor

Bright screen and wide viewing angle of the IPS monitor panel allow users to see data clearly from any angle.

Easy connectivity with various devices

Not only easily compatible with the standard DICOM format but also enables seamless data review on a PC via our proprietary HHS-1 software.

Screening report provision and convenient printing method

Report information can be printed conveniently without cables using the optional Bluetooth printer.

Various data transmission methods and fast search and management

A database of up to 7,000 individuals can be quickly accessed and searched by page, with bulk data transfer supported via USB, Ethernet, or Wi-Fi.



CVS Dark Box: Ensures
standardized testing
distances and controlled
low-light environments.

Screening report

SPECIFICATIONS

Spherical	Range	-8.0D to +8.0D	
	Increment step	0.01D, 0.25D	
	Accuracy	-3.50D to +3.50D	$\pm 0.5D$
		-8.0D to < -3.50D	$\pm 1.0D$
		> +3.50D to +8.0D	$\pm 1.0D$

Cylindrical	Range	-3.0D to +3.0D	
	Increment step	0.01D, 0.25D	
	Accuracy	-1.50D to +1.50D	$\pm 0.5D$
		-3.00D to < -1.50D	$\pm 1.0D$
		> +1.50D to +3.00D	$\pm 1.0D$

Axis	Range	0 - 180°	
	Increment step	1°	
	Accuracy	$\pm 10^\circ$	For CYL's values > 0.50D

Pupil size	Range	4.0 - 9.0mm	
	Increment step	0.1mm	
	Accuracy	$\pm 0.4mm$	

Pupil distance	Range	35 - 80mm	
	Increment step	1mm	
	Accuracy	$\pm 1.5mm$	

Measurement time	Average	$\leq 1s$
Measuring distance	Range	100cm $\pm$ 5cm
LCD	IPS 800X480	
Printer	BIXOLON Bluetooth Thermal printer(Optional)	
Fixation target	visual pattern / audible sound	
wireless network	802.11 b/g/n	
interface	USB 2.0	

Specification and design are subject to change without notice.





CDC-1

LCD Spacesaving Chart

An extensive range of charts and vision testing procedures for the most precise prescriptions.

Discover the extensive range of CHAROPS LCD Space-saving Charts and Optotypes System

Various Types of Standard Visual Acuity Charts

With over 100 charts, the CDC-1 supports various tests for visual acuity and function. Standard tests include Letters, Numbers, Landolt C, Snellen E, children charts, and other special charts designed for specific needs.



Polarized Charts and Functional Charts

The CDC-1 offers diverse polarized charts suitable for various tests, including those utilizing Cross Cylinder, Red/Green, Polarization, and other special lenses. These charts facilitate examinations such as the Binocular Vision Test, Stereoscopic Vision Test, Heterophoria/Heterotopia Test, Binocular Balance Test, Fusion and Suppression Test, Aniseikonia Test, and more.

Smart Display Function

The CDC-1 offers single-letter and horizontal/vertical line masking, always presenting the image at the center of the screen. This feature eliminates testing bias by preventing patients from memorizing optotype positions.

Standardized ETDRS

CDC-1 provides ETDRS acuity testing at different distances, along with a diverse selection of ETDRS LogMAR tests. (ETDRS acuity testing is now the global standard, frequently preferred over traditional Snellen and Sloan charts.)



Color Vision Test

The CDC-1 offers 12 color blindness testing charts and 9 charts for classifying levels of visual impairment.



Contrast Sensitivity Test

The CDC-1 includes a feature for measuring contrast sensitivity at different levels using letter charts and bars. Results are analyzed and displayed in detail, providing a comprehensive and professional clinical diagnosis.



Video display and Image Slide Function

The CDC-1 provides patients with illustrative examples that explain various refractive errors like myopia, hyperopia, and astigmatism. Additionally, according to the user's preference, it can play videos or display images stored on a USB memory device. This feature can also be used for in-shop marketing while the system is in screensaver mode.

A great variety of charts and vision test procedures
bring you the most accurate prescription!

The most complete variety of CHAROPS LCD Spacesaving Charts and Optotypes System.

Polarized Charts and Stereoscopic Vision Test

Utilizing advanced polarized LCD technology, the system supports a wide array of functional tests, including binocular balance and stereoscopic vision.

Comprehensive Test Range

The high-resolutionLCD ensures distortian-free rendering of even the smallest optotypes, providing a comprehensive range of acuity tests.

System Integration

Seamlessly integrate the CDC-1 with the CHAROPS CDR-9000 Digital Refractor for a faster, more streamlined diagnostic workflow. All functions of the CDC-1 chart can also be operated directly from the control panel of the CDR-9000.

Convenient User Menu

The CDC-1 features an intuitive menu designed for easy navigation of specialized visual function tests.

Selectable Working Distance

Adjustable working distances (0.65m, 0.85m, and 1.05m) ensure compatibility with any testing environment.

Easy to Upgrade

Easily update the CDC-1 by connecting a USB drive loaded with the latest software to the dedicated port.



SPECIFICATIONS

Chart Window Size	5inch
Power Supply	100-240V, 1.5-0.75 A, 50-60 Hz
Power Consumption	60VA
Dimensions	L390 *W370 *H592 (mm)
Remote Controller Size	64mm(W) x 195mm(H) x 21mm(D) / 160g
Working Distance	0.65m、0.85m、1.05m
Connections	USB (Memory Stick), CAN, VGA
Communication	Wire (CAN) – CDR-9000 can be integrated. can be integrated.
Optional Accessories	RG glasses, Polarized glasses
Charts	Landolt C, Letter, Number, Snellen E, Children, Russian, Hiragana Functional charts (Red/Green, Cross Cylinder, Binocular Balance, Fusion and Suppression, Heterophoria, Aniseikonia, Stereoscopic Vision Test, etc.
Mask Filter	Letter, Horizontal Line, Vertical Line, Red/Green Filter
User Menu	Video and Image mode Background Luminance Red/Green Balance Compensation for Red/Green Filter Random Function Space Interval of Optotype Chart Background Reverse
Special Tests	Ior Vision Test Contrast Sensitivity Test

Designs and details can be changed without prior notice for improvements.



CDC-7000

Auto Visual Acuity Tester

Robust design, a wide and bright screen for convenient vision testing, featuring an extensive range of charts and industry-leading mask transition speeds.

Strong support for Chart functions

The CDC-7000 supports 31 types of general and special test charts for vision testing, along with excellent filtering and masking capabilities.

Ergonomically designed remote control

Strategically placed buttons ensure intuitive and efficient operation during all testing procedures.

Flexible networking capabilities

The implementation of high-speed, flexible 100K bps networking capabilities, supported by the CAN method, creates a robust environment optimized for multi-device communication.

Anti-reflective wide-screen display

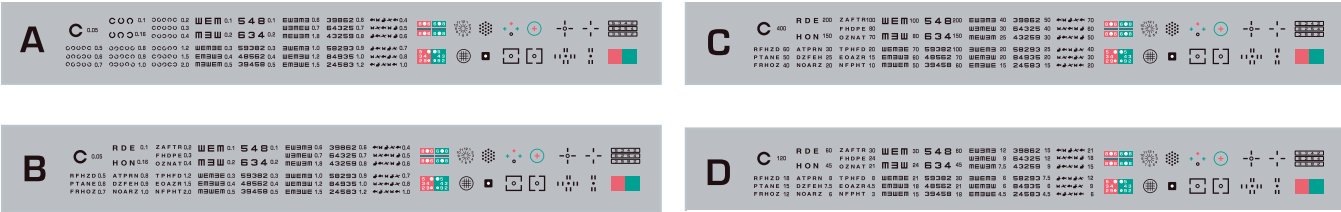
It consistently delivers clear images regardless of lighting conditions, reducing eye strain by minimizing unnecessary convergence and accommodative stress during testing.

SPECIFICATIONS

Refracting Distance	5m
Installation Distance	1.1
Built-in Chart	31
Chart Speed	0.8 seconds(average)
Masks	Single isolated,Vetical,Horizontal
Chart Tilting	20cm
Lamp	12V,2.5W LED Module
Automatic Power Off	10 minutes
Dimension	400mm(W)X280mm(D)X545mm(H)
Weight	18kg
Power Supply	AC 100-120/200-240,50/60Hz,2.0/1.0A
Power Consumption	90W

Specifications are subject to change without notice for product improvement.

Chart Type





CDC-3N/PF

Digital Chart

A vast array of charts and vision test procedures for the most precise prescriptions.

The comprehensive CHAROPS CDC-3N/PF LCD Optotypes System—now featuring Full HD technology.



High Resolution 24" LCD Chart

The 24" Full HD (1920 x 1080) polarized TFT-LCD panel delivers superior chart clarity. Polarized Charts and Stereoscopic Vision Test By adopting a polarizing LCD panel, enabling a full suite of clinical assessments, including heterophoria, binocular balance, and stereopsis testing.

Comprehensive Test Range

The high-resolution display ensures distortion-free rendering across a wide testing range (0.03 to 2.0). Adjustable working distances (1.5m to 6m) ensure versatility across various clinical environments.

Easy to Upgrade

CDC-3 N/PF can be upgraded automatically simply by uploading the new software to the USB memory and plugging it into the USB slot.

Various Types of Standard Visual Acuity Charts

With over 100 charts, the CDC-3N/PF supports a comprehensive range of visual acuity and functional tests. Standard charts include tests such as Letter, Number, Landolt C, Snellen E, Children chart and other specialty charts as well.



Polarized Charts and Functional Charts

CDC-3N/PF provides a variety of polarized charts that can be applied to many types of tests using the Cross Cylinder, Red/Green, Polarization and specialized lenses to facilitate Binocular Vision, Stereopsis, and Aniseikonia testing.

Standardized ETDRS

CDC -3N/PF offers the ETDRS acuity at various test distances and a wide variety of ETDRS LogMAR tests are also available. (ETDRS acuity testing has become the worldwide standard for visual acuity testing replacing the Snellen and Sloan acuity tests.)



Color Vision Test

CDC-3N/PF includes 12 charts for color deficiency screening and 9 charts for classifying the degree of color impairment.



Contrast Sensitivity Test

The CDC-3N/PF also has a function to measure contrast sensitivity at various levels using letter charts and the bar. The results of tests are analyzed and displayed providing the patient with more details and a professional and analytical diagnosis.



Hue Test

For the color blindness test, the HDC-9100N/PF supports a professional 85-hue assessment for detailed chromatic discrimination.



Playing Video and Image Slide Function

The HDC-9100N/PF provides patients with illustrative examples of refractive errors, including myopia, hyperopia, and astigmatism. It is also possible to play video or display images stored to the USB memory at user preference. This can be used to advertise the optical shop during the screen saver mode.

Amsler Grid Test

The Amsler Grid feature allows for efficient screening and monitoring of macular degeneration.

CDC-3N/PF Charops Digital Chart

Specifications

LCD Type	N-Type (Non- Polarized Panel) : 24 inch Full HD TFT LCD PF-Type (Polarized Panel) : 24 inch Full HD TFT LCD
Resolution	1920 x 1080 pixels
White Luminance	250cd/m ²
Chart Window Size	24 inch : 531.4 mm (H) x 298.9 mm (V)
Adapter Power Consumption	100-250 V~, 1.5-0.75 A, 50-60 Hz Model: MDS-060AAS12BM
Product Power Consumption	12VDC,4A
Main Body Size / Weight	568mm(W)x336mm(H)x80mm(D)/6.1kg
Remote Control Size / Weight	64mm(W)x195mm(H)x21mm(D)/160 g
Test Distance	1.5 m ~ 6 m (0.1 m Step)
External Input	USB (Memory stick), CAN
Controls	Wired (CAN): CDR-1, CDR-3, CDR-5 Wireless (IR) Bluetooth 3.0
Main Body Fixing	Method Wall Mount
Optional	Red/Green Glasses Polarization Glasses
Chart	· Landolt Ring, Alphabet, Number, Tumbling E · Figures for Children, Russian Letter, Hiragana · Functional Chart (Red/Green, Cross Cylinder, Binocular Balance, · Fusion Suppression,Phoria, Aniseikonia, Streopsis etc.)
Masking Filter	Dot, Row, Column Red/Green Filter
Setting	· Change IR Channel of Remote Controller (10 Channel) · Mode for Movie or Photo · Sleep Mode · Contrast Rearrange · Red/Green Balance · Color Adjustment for Red/Green Filter · Random Function · Chart Space Adjustment · Chart Background Switching
Test	· Color Vision Test · HUE Test · ContrastSensitivity Test
Etc.	· Vergence, Saccadic, Stereopsis Training · Custom Program (2 Program Support)

*Specification and design are subject to change without notice.



Red · Green / Polarization Glasses (sold separately)



CCP-9000

Chart Projector

For precise acuity testing with high-quality charts, a chart projector is the ideal choice

The CCP-9000 fulfills its promises by employing a total refraction system, ensuring accurate and efficient performance for any desired test. It enables the swift and precise changing of various charts within a very short time.

Clear and Fast High Quality Charts

The CCP-9000 delivers high-resolution performance, ensuring razor-sharp graphics and rapid chart changes.

Bright and Efficient LED light

The long-life LED light source provides superior brightness and clarity compared to conventional halogen bulbs.

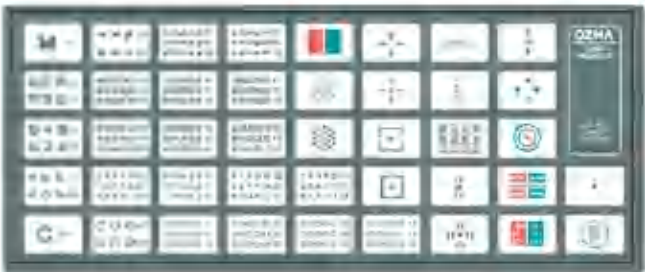
SPECIFICATIONS

Chart	41 chart 34 mask, Red/ Green & Polarization Filters
Projection Distance	2.5~8m
Chart Rotation Speed	Average 0.15 sec
Projection Magnification	30 x at 5m
Power Saving	Automatic Switch off (10 min)
Program	2 programs with a maximum of 30 charts each
Tilt Angle	15°
Power Supply	110-120V / 200-240V, 50/ 60Hz
Power Consumption	Max 0.6A
Lamp	LED 4W
Dimension	270(W) X 182(D) X 230(H)mm
Weight	3.5kg

Designs and details can be changed without prior notice for improvements.

Easy and Convenient Best Networking

The CCP-9000 integrates seamlessly with digital refractors, such as the OZMA system, for optimized efficiency.



Wide range of features

The CCP-9000, equipped with 41 charts including Red/Green and polarizing filters, provides advanced diagnostic solutions for Binocular Balance, Stereopsis, Aniseikonia, and Fusion testing..





CDR-9000

Digital Refractor

For fast, accurate, and convenient refraction tests, the slim-designed Phoroptor could be the ideal solution.

Achieve precise results with a range of vision tests, from basic to advanced. The luxurious design and intuitive graphic interface meet the highest standards of aesthetic and functional comfort.

Powerful cross cylinder lens

The dual cross-cylinder lens enables fast and convenient examinations. The automatic occlusion feature prevents patient accommodation during lens rotation or mode transitions.



Test process programming

Up to 10 customized test processes can be programmed and saved, including detailed settings for unit test chart conversion, auxiliary lens insertion, fogging, chart masking, and more.



Real time guide

The intuitive on-screen graphics provide real-time guidance for a faster, more streamlined refraction process.



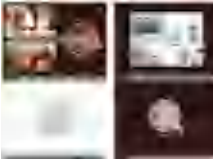
Displaying the result in tables and graphics

Comprehensive test results are presented via intuitive tables and graphics for rapid clinical interpretation.



Various image clips

The system includes a color blindness test, Amsler's Grid, and numerous other near-vision charts for comprehensive testing. Additionally, a library of educational media, including progressive lens guides and ocular diagrams, enhances patient communication.



Touch screen & Multi fuction jog dial

The touchscreen interface provides an intuitive and convenient operational guide. The multifunctional jog dial enables rapid lens selection and seamless program execution.



SPECIFICATIONS

MEASUREMENT RANGE

Spherical Lens	29.00~+26.75D (Regular) -19.00~+16.75D (Cross Cylinder or Prism test) (0.12D/0.25D/0.5D/1.0D/2.0D/3.0D/4.0D increments)
Cylinder Lens	0.00~±8.75D(0.25D/0.5D/1D/2D/3D increments)
Cylinder Axis	0° ~180° (1° /5° /15° increments)
PD	48~80mm (0.5/1mm increments) Near working distance:35~70cm
Rotary Prism	0 ~ 20 △ (0.1 △ /0.2 △ /0.5 △ /1 △ /2 △ increments)
Cross Cylinder	±0.25D, ±0.50D, ±0.25D Dual Cross Cylinder (Split prism lens)
Retinoscope	+1.5D,+2.0D (Measurement Distance 67cm,50cm)

AUXILIARY LENS

Pin Hole Lens	Ø2mm
Madox Rode	Right Eye(Red,Horizontal),Left Eye(Red,Vertical)
Red /Green Filter	Right Eye(Red),Left Eye(Green)
Polarizing Filter	Right Eye:(135° ,45°)Left Eye:(45° ,135°)
Split Prism	Right Eye (6 △ BU)Left Eye (10 △ BI:up to 5 △ complement)
Fixed Cross Cylinder	(±0.50D,Fixed with the axis set at 90°)

DIMENSION

Refractor	361(W)x108(D)x280(H)mm/4.7 kg
Controller	216(W)x246(D)x225(H)mm/ 1.89kg(Printer included)
Junction Box	251(W)x240(D)x71(H)mm/1.88kg
Power supply	AC 100-120V/AC 220-240V 50 /60Hz
Power consumption	145VA

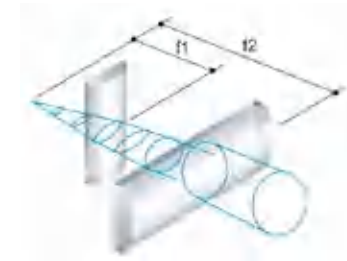
Designs and details can be changed without prior notice for the purposes of improvement.



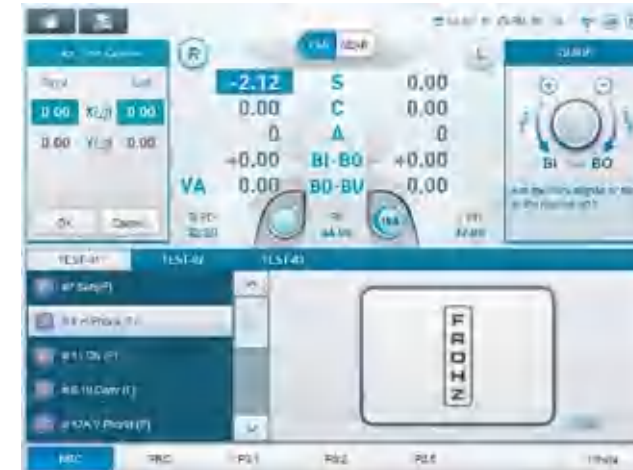
CDR-5

Digital Refractor

Cross Cylinder Lens



21-point Exams #8 H, Phoria (F)



PD Adjustment

Automatic Convergence
Function

Tiltable Body

Highly advanced near vision exam is facilitated by a 0° to 45° tiltable body, simulating a natural reading posture for the patient.

Fast and Silent Lens Loading

Rapid lens loading minimizes accommodative stress and reduces patient eye fatigue during testing. Silent operation offers more comfort during exam.

Slimmer Design

The ultra-slim profile minimizes mechanical interference, ensuring an unobstructed view and easier patient monitoring.

21 Point Exam

The 21-Point Exam streamlines complex refraction procedures, allowing practitioners to achieve precise results with greater ease. The system provides clear, data-driven results on-screen, eliminating the need for complex manual interpretations. Guidance with prism, addition power prescription and visual function test in accordance with exam results are available for easy use.

Cross Cylinder Lens

Supports highly accurate assessments of astigmatism and visual acuity via dual and Jackson cross-cylinder lenses. High-speed lens transitions prevent patient accommodation from interfering with exam accuracy.

Monocular Height Adjustment

Customized exam is available for those who have different monocular heights within adjustment +/- 3mm.

Illuminated Vertex Distance
Check WindowIllumination / Detachable
Near Chart Rod

Tiltable Refractor Body

Various Charts and Contents

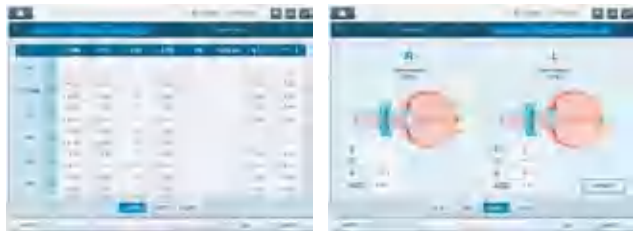
The system offers a diverse range of highly reliable near-vision test charts and vision therapy content.

Real Time Guide

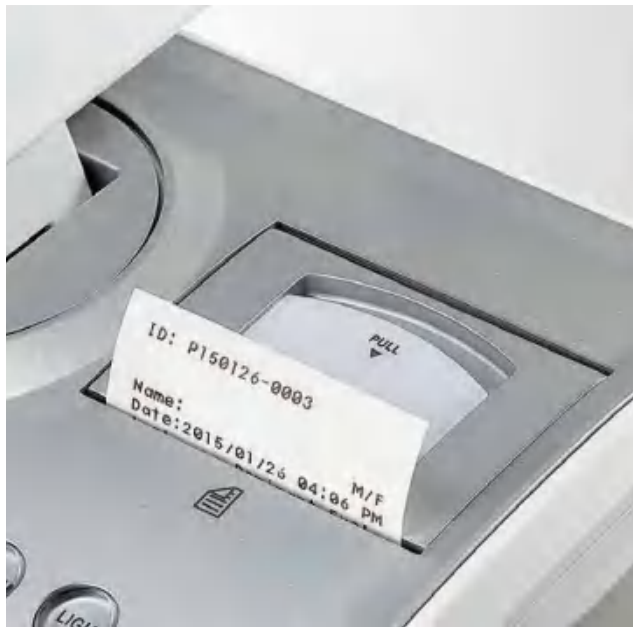
Real-time on-screen graphics guide the user through the testing process for increased efficiency.

Easy Explanatory Images

Includes specialized charts for color deficiency screening, Amsler Grid testing, and anatomical ocular imaging. Refractive data and progressive lens visualizations help simplify complex results for patient education.



Displaying the Result in Tables and Graphics



Built-in Printer



Various Charts / Real Time Guide

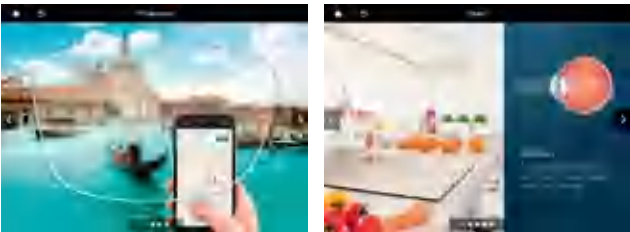


Image Clips - Progressive

Image Clips - Vision

Tilting and Swiveling Display

The tilt-and-swivel display ensures optimal visibility for the practitioner, regardless of the patient's position.

Built-in Printer

The integrated thermal printer features a "drop-in" paper loading system for effortless maintenance.

Specifications

Measurement Range

Spherical Lens	-25.00~+25.00D (Regular) (0.12/0.25/0.5/1/2/3/4D increments)
Cylinder Lens	0.00~±8.75D (0.25/0.5/1/2/3D increments)
Cylinder Axis	0~180 (1/5/15 increments)
PD	48~80mm (0.5/1mm increments) Near PD : 50~75 mm Near Working Distance : 35~70cm
Rotary Prism Lens	0~20 △ (0.1/0.2/0.5/1/2 △ increments)
Cross Cylinder	±0.25D ±0.50D ±0.25D Prism Split Lens (Dual Cross Cylinder)
Retinoscopic Lens	+1.5D, +2.0D (Measurement Distance 67cm, 50cm)

Auxiliary Lenses

Occluding Aperture	
Pinhole Lens	Ø 2mm
Maddox Rod Right Eye	(Red, Horizontal), Left Eye (Red, Vertical)
Red / Green Filter	Right Eye (Red), Left Eye (Green)
Polarizing Filter	Right Eye (135 , 45), Left Eye (45 , 135)
Split(Dissociation) Prism	Right Eye (6 △ BU) Left Eye (10 △ BI : up to 5 △ complement)
PD Check Lens	
Fixed XC Lens	(±0.50D, with the axis fixed at 90)
Visual Field	40 (VD=12mm)

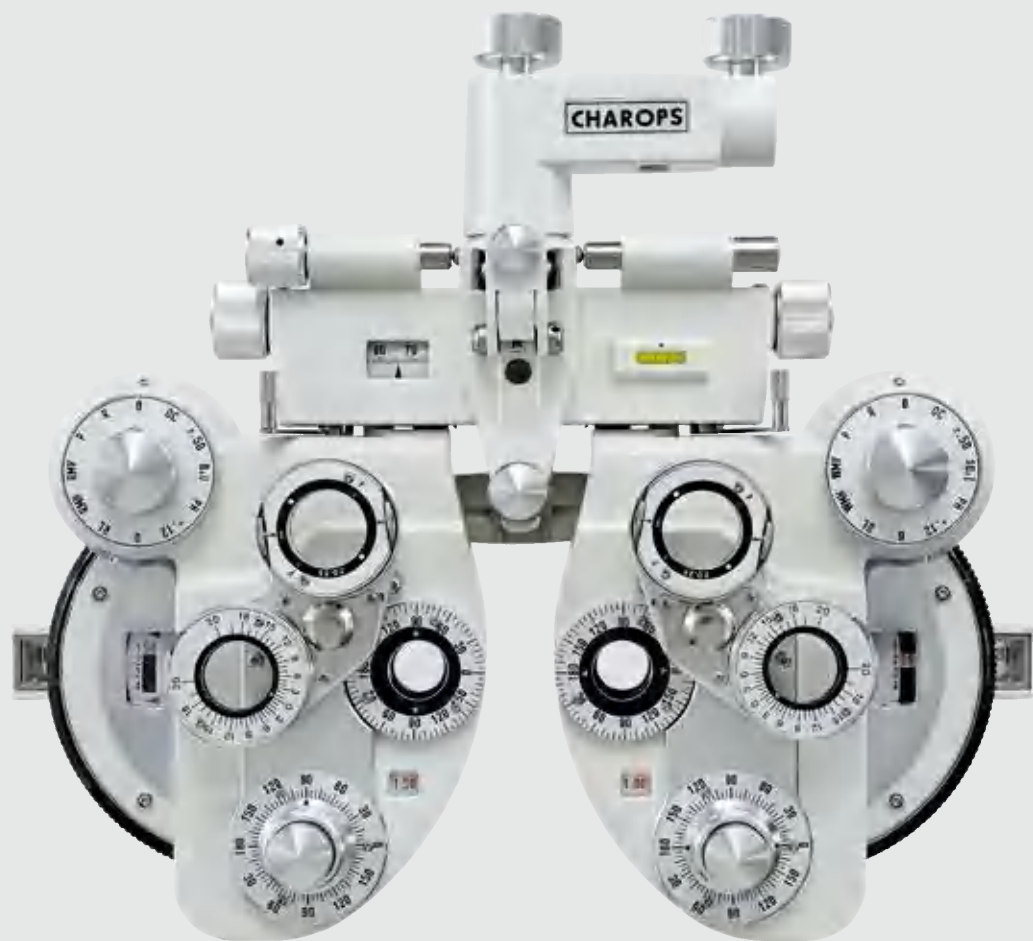
Hardware Specification

Screen	10.4-inch LCD touch screen (1024x768)
Digital Refractor	329(W)x103(D)×296(H)mm,4.20kg
Operation Panel	249(W) X 245(D) X 248(H)mm, 2.75kg (including internal printer)
Junction Box	240(W) X 141(D) X 71(H)mm, 1.24kg
Power Supply	100-240VAC~, 1.0~0.5A, 50/60Hz

*Designs and details can be changed without prior notice for the purposes of improvement.

System Networking





VT-5B

Phoropter

SPECIFICATIONS

Sphere power range:	+16.75D~-19.00D
	Step:0.25D (When applied with auxiliary lens +0.12D, Step: 0.12D)
Cylinder power range:	0D~-6.00D(When applied with auxiliary cylinder lens -2.00D, 0D~ -8.00D)
	Step: 0.25D(When applied with auxiliary cylinder lens +0.12D, Step: 0.12D)
Cylinder axis range:	0° ~180° Step: 5°
Cross cylinder:	+ 0.25D Cross cylinder lens (synchronized with cylinder axis)
Rotary prism range:	0Δ~20 Δ Step:1 Δ
P.D.Adjustment:	50-80mm, Step:1mm
Convergence adjustment:	∞ ,40cm(When P.D.64mm)
Forehead rest adjustment:	16mm
Vertex distance:	13.75mm (From corneal point to standard lens surface)
Dimensions:	323(L)x85(W) x 315(H)mm
Weight:	5kg

Designs and details can be changed without prior notice for improvements.





CLM-1 Lensmeter

Faster, More Accurate Results with the CLM-1

The new CLM-1, from Charops, has a slim and modern design.

Its Hartmann Sensor Wavefront Analysis Technology makes the measured values more accurate and reliable.

Surprisingly great economical value for the new standard features brought to you by Charops in the CLM-1.

Wavefront Analysis Technology with the Hartmann Sensor

Utilizing Hartmann Sensor Wavefront Analysis Technology, our latest generation ensures superior accuracy by utilizing an increased number of measurement points.



Hartmann Sensor

Expanded Prism Measurement Range

An expanded prism measurement range (up to 20Δ) allows for comprehensive testing in all directions (BU, BD, BI, and BO).



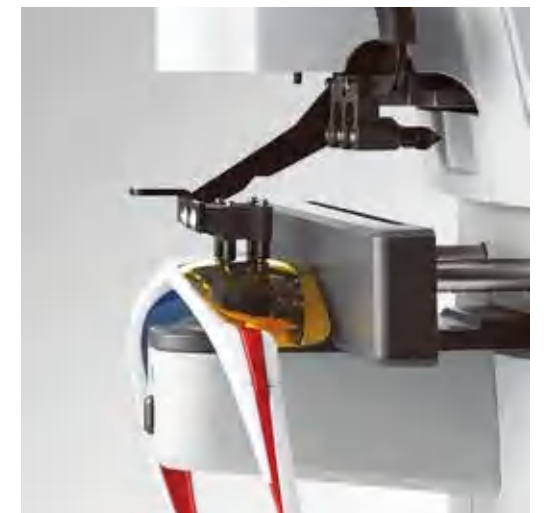
Prism Measurement

Wide Range for Measuring Small or Large (Blank) Lenses

Accommodates a wide range of lens diameters, from 15mm to 120mm.

Easily Measures Sunglasses

When measuring the refractive power of darkly tinted or mirrored sunglasses, the CLM-1 automatically adjusts light intensity to calculate refractive power, ensuring seamless measurement without manual input.



Mirror Lens Measurement

Blue Light Transmission Analysis via 4-Wavelength LED System

The CLM-1 analyzes transmission across four key wavelengths: 395nm (UV), 415nm (Low Blue), 460nm (High Blue), and 545nm (Green).



Minimize the Distance between P.D Bar and Lens Support

Slim and Compact Design

Measuring only 182x415x235mm,the CLM-1 is perfectly suited for modern, space-efficient clinical environments.

Auto Lens Recognition

The CLM-1 automatically detects lens types—including Single Vision and Progressive—and instantly switches to the correct measurement mode.

Improved Progressive(Multifocal) Lens Measurement

On-screen guides and responsive target tracking ensure fast, intuitive measurement of progressive lenses.



Progressive Lens Measurement



Auto Lens Recognition

User-Friendly Graphical Interface

The new Graphical User Interface (GUI) is bright and easily visible, providing real-time feedback and intuitive guidance for streamlined operation.

QR Code

Measurement data can be exported instantly via an on-screen QR code.



SPECIFICATIONS

Measurement Range	Spherical Power	0D-±25D (0.25/0.12/0.06/0.01)
	Cylinder Power	0D-±10.00D (0.25/0.12/0.06/0.01)
	Cylinder Axis	0° -180° (1° step)
	Progressive Power	0-10D (0.25/0.12/0.06/0.01)
	Prism	0-20 △ (0.25/0.12/0.06/0.01)
Measurement Mode	Cylinder	±,+, -
	Prism	Rectangular/Pole/Displacement
	LED Wavelength	545nm(Green)
	Contact Lens	Hard/Soft Contact Lens
	Abbe Value	Manual Revision
	Wavelength	e-Line,d-Line
	Transmission	395nm(UV)415nm(Blue-Low) 460nm(Blue-High)545nm(Green)
Others	Screen	5.7" Color LCD Panel (640x480)
	Interface	RS-232 QR Code
	Communication Speed (bps)	9600,57600,115200 bps
	Internal Printer	Thermal Line Printer (Option)
Product Size /Weight	187(W)x234(D)x413(H)mm/4.3Kg	
Power Supply	DC12A MAX2.0A	

Designs and details can be changed without prior notice for the purposes of improvement.

CRT-8800/CDC

Refraction System



Whole Machine Dimensions	L2200×W1100×H1700mm
Table size	L1060xW450xH860mm
Power arm operates the Z axis	200mm(±20mm)
Power arm left-right range	40° (left: 25° /right: 15°)
Chair size	L700×W700×H1320mm
Chair up-down range	150mm(±10mm)
Power	100-120/200-240v,50/60Hz,3/2A
Lamp bulb	LED 灯 3W
Weight	

Designs and details can be changed without prior notice for the purposes of improvement.

CRT-8800/CCP

Refraction System



Whole Machine Dimensions	L1200×W1100×H1900mm
Table size	L1060xW450xH860mm
Power arm operates the Z axis	200mm(±20mm)
Power arm left-right range	40° (left: 25° /right: 15°)
Chair size	L700×W700×H1320mm
Chair up-down range	150mm(±10mm)
Power	100-120/200-240v,50/60Hz,3/2A
Lamp bulb	LED 灯 3W

Designs and details can be changed without prior notice for the purposes of improvement.

CRT-8800

Refraction System



Whole Machine Dimensions	L2200×W1100×H1700mm
Table size	L1060xW450xH860mm
Power arm operates the Z axis	200mm(±20mm)
Power arm left-right range	40° (left: 25° /right: 15°)
Chair size	L700×W700×H1320mm
Chair up-down range	150mm(±10mm)
Power	100-120/200-240v,50/60Hz,3/2A
Lamp bulb	LED 灯 3W
Weight	290kg

Designs and details can be changed without prior notice for the purposes of improvement.

CRT-1

Refraction System



SPECIFICATIONS	
Table size	L1050mm×W600mm
Table up-down range	789mm(±98mm) (eroor±10mm)
Power	100-120/200~240V,50/60Hz,3/2A
Lamp bulb	LED 灯 3W

Designs and details can be changed without prior notice for the purposes of improvement.



CEP-5000 / CEP-5000P

Patternless Edger

Reliable edging performance, intuitive interface, and high-efficiency multitasking.

CHAROPS's innovative technology not only saves equipment space, but most importantly, reduces user costs, providing a good solution for current edge grinders.

Adaptive Clamp Chuck to prevent lens deformation

Minimizes axis torque to prevent lens and coating damage, specifically when processing high-base curve lenses.

- Automatic adjustment for 3-step pressure (high, medium, low)
- Manual input adjustment (from 50 to 150%)



Powerful multi-tasking with the new concurrent processing Job Manager

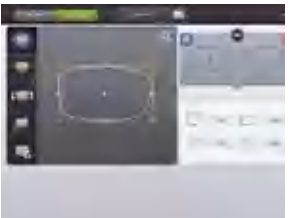
The Job Manager displays real-time task status, allowing for the concurrent processing of subsequent jobs during operation.

Large memory storage for unlimited job data.
Barcode interface support for changing job file name, importing and searching job files.



Powerful Digital Pattern and Editing function

Function to modify and change lens size, shape and rotation
Frame Modification: Easily correct frame distortion using R/L exchange or mirroring functions.



Integrated tracer for 3D measurements

Auto or Semi-Auto or Concave mode can be selected.
In Semi-Auto mode, the user may manually place the stylus into the narrow groove of challenging frames. In Concave mode, the system recognizes the concave shape of the demo lens.
Simultaneous frame tracing and lens edging significantly enhances workflow efficiency and reduces total turnaround time.
Higher durability and precision due to Tilting Lock preventing axis distortion

Edger Specification

Lens Material	Plastic, Polycarbonate, High Index Plastic, Glass, Trivex
Wheel	Diameter 100mm, RPG Type
Edging Mode	Beveling(Normal / Partial / Mini Bevel) (CEP-5000P) Grooving(Normal / Partial / Hybrid / Dual Grooving) (CEP-5000P) Flat Edging Safety Beveling Polishin *Auto/Manual position with 2D/3D simulation supported for beveling and grooving.
Functions	Job Manager, Digital Pattern, Retouch, Bevel / Groove Simulation, Shape Mirroring, Concave Shape
Utilities	Manual Edging Room Door(Hinged Door) Edging Room Illumination Single Side Feeling(Front, Rear) SD Card Storage(Memory Included)
Display	9.7 inch Color TFT LCD(1024x768) with Touch Scree
Edging Size	Max : 90mm Min: Flat Edging : 18.5mm(without Safety Bevel)/ 23.0mm(with Safety Bevel) Bevel Edging : 20.0mm(without Safety Bevel)/24.7mm(with Safety Bevel)
Dimensions / Weight	604(W)×571(D)× 369(H)mm / 47kg or Less(without Tracer Module)

Tracer Specification

Tracing Type	Automatic 3D Binocular Tracing
Tracing Mode	Auto, Semi-Auto
Tracing Size	Frame 16.0~92.0mm, Pattern 016.0~84.0mm
Frame Material	Metal, Hard Plastic, Soft Plastic
Data Processing	FPD, Frame Curve, Circumference, 3D Angle, Concave Shape

*Specification and design are subject to change without notice.



CEP-8800/CEP-8800P

Patternless Edger

Customized Mini Bevel

Bevel height is customizable for frames with short groove depth and produces lenses that fit seamlessly into shallow-groove frames.(Mini Bevel Height : Min 0.1~Max 0.8mm



Highly Efficient CPU

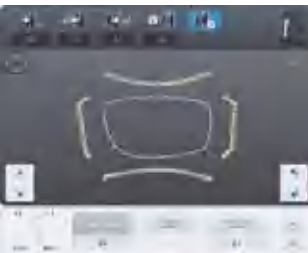
The high-performance 1GHz CPU enables concurrent job management for uninterrupted workflow.

Partial & Hybrid Grooving

A combination of sectional grooving and beveling - Partial & Hybrid Grooving Function - supports processing of more variety of frames.

Auto / Manual 3D Simulation

3D simulation supports easier bevel/groove positioning.
Auto positioning function reads frame and lens curve automatically and automatically determines the optimal bevel and groove positioning.
Additionally, manual positioning function allows opticians to manually position bevel/groove for the best result.



Bidirectional Feeling - Processing Time Reduction

Enhanced bidirectional feelers provide superior durability; simultaneous front and back sensing reduces lens thickness measurement time by up to 50%.

Larger Wheels - Processing Time Reduction

Larger grinding wheels reduce processing time by 30% compared to previous models.

Powerful Direct Motor Drive

The high-torque 1 HP servo motor ensures rapid response times and peak processing efficiency.



Specification

Lens Material	Plastic, Polycarbonate, High Index Plastic, Glass, Trivex
Wheel	Diameter 150mm, RPG Type
Edging Mode	Beveling (Normal / Auto / Manual Mode, Mini Bevel Option) (CEP-8800P) Grooving (Normal /Auto / Manual Mode, Partial / Hybrid/ Dual Grooving Option) (CEP-8800P) Flat Edging Safety Beveling Polishing
Functions	Job Manager, Digital Pattern, Hole Editor, Retouch, Bevel / Groove Simulation, Shape Mirroring, Easy Click, Concave Shape, Scan & Cut (Optional)
Utilities	LCD Tilting Automatic Edging Room Door Edging Room illumination Simultaneous Bilateral feeling SD Card Storage (Memory Included) Barcode Reader (Optional) Vacuum Interface (Optional)
HW Platform	GUI(1GHz), Motor (120MHz)
Display	9.7 inch Color TFT LCD(1024x768) with Touch Screen
Edging Size	Max : 90mm Min: Flat Edging: 18.5mm (without safety bevel) /23.0mm (with safety bevel) Bevel Edging: 20mm (without safety bevel)/24.7mm (with safety bevel)
Dimensions	540(W)x462(D)x597(H)
Weight	55kg
Power Supply	AC 100-120V/AC 200-230V 50/60Hz
Power Consumption	1200W(110V),1500W(220V)

*Designs and details can be changed without prior notice for the purposes of improvement.



CEP-8800(P) CFR-8800 CMB-8800



CME-1
Edger

Engineered Integration of Proven Edging Technology

CME-1 adopts the design style of traditional automatic edgers, featuring an intuitive interface, user-friendly operation, and a transparent top cover for easy observation.

Operation Key Button

Featuring an intuitive, visual design that is user-friendly, easy to comprehend and learn.



Three-Stage Adjustable Head Pressure

Variable head pressure with three distinct settings ensures safe and reliable processing for all lens materials.



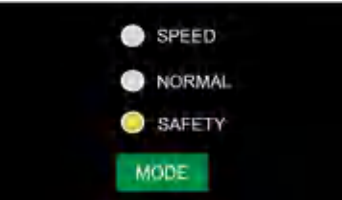
Hall Sensor Contact Point

It adopts Hall sensor contact points to replace traditional micro switches, ensuring minimal deviation in lens dimensions.



Safe Processing Mode for Lenses with Hydrophobic Coating

To better meet the cutting requirements of lenses with a hydrophobic coating, a dedicated "Safe Edging" option has been developed specifically. This mode is engineered to eliminate lens slippage throughout the edging cycle. (Note: This mode requires the use of high-quality double-sided tape and the specified suction cups.)



Sustained Clamping Pressure

The 3-step adjustable clamping pressure program provides precise and consistent clamping force for various lens types, to prevent lens fractures or positional slippage caused by pressure fluctuations.



Grinding Wheel Set

This product offers two 4-wheel configuration sets. To achieve superior edging results, a high-performance precision bevel edging wheel option is specifically designed for high-index resin lenses, meeting the most rigorous laboratory standards..



SPECIFICATIONS	
Edging options	Bevel Edging Rimless Edging
Edging Position	Free floating(Depends on the lens thickness and front curve
Edging Modes	Speed, Normal, Safety
Lens Material	Plastic, Glass, Polycarbonate
Edging Size	Max : Ø90mm Min : Ø26mm
Dimensions	516.4(W) x 482(D) x 405.3(H)
Weight	40kg
Power Supply	AC 200~240V, 50Hz
Power Consumption	840W
Outlet	Max 150W (200-240 Vac)

*Design and details can be changed without prior notice for improvements



CSL-3000/CSL-5000

Slit Lamp Microscope

Classic Optical Structure

Engineered by CHAROPS (South Korea), this medical-grade slit lamp features a high-fidelity binocular optical system. It not only delivers clear images and a wide field of view but also, seamlessly integrates with digital cameras for high-definition ocular imaging and video capture. A professional image management system is included to optimize clinical workflow.

Standard Optical System

A world-class Galilean converging binocular system ensures superior image clarity and an expansive field of view.



Illumination System

A 12V, 30W high-brightness halogen lamp provides excellent clarity for both images and videos.



Camera Specifications

Camera Type & Interface	5MP Integrated Camera	USB 3.0
	External DSLR Camera	USB 3.0
Power Supply	5MP Integrated Camera	USB 3.0
	External DSLR Camera	Battery
Max Resolution & Effective Pixels	5MP Integrated Camera	2592×2048
	External DSLR Camera	≥ 1800 万
Dimensions	5MP Integrated Camera	29mm×29mm×30mm
	DSLR Beam Splitter	133.1×99.5×79.7mm



Slit Lamp Microscope Specifications

Magnification Adjustment Type	Model CSL-3000	Drum-type, 3-speed magnification
	Model CSL-5000	Drum-type, 5-speed magnification
Magnification Levels	Model CSL-3000	10x/16x/25x
	Model CSL-5000	6x/10x/16x/25x/40x
Total Magnification & Actual Field of View	Model CSL-3000	11x(Ø22.2mm)、16x(Ø15.2mm)、23.2x(Ø10.5mm)
	Model CSL-5000	6.5x(Ø38.5mm)、11x(Ø22.2mm)、16x(Ø15.2mm)、23.2x(Ø10.5mm)、39.3x(Ø6.1mm)
Type	Galilean Type	
Eyepiece	Magnification	12.5x
	Diopter Adjustment Range	-5D~+5D
	Pupillary Distance Range	55-80mm
Slit Length	0.3–14 mm (continuously adjustable)	
Slit Width	0–14 mm (continuously adjustable)	
Spot Diameter	Ø0.3/1/3/5/9/14mm	
Filters	Cobalt Blue Filter, Red-Free Filter, Neutral Density Filter, Heat Filter	
Slit Rotation	0° ~180° (continuously adjustable)	
Slit Tilt Angle	0/5/10/15° /20°	
Vertical Movement	28mm	
Horizontal Movement (Front-Back)	100mm	
Horizontal Movement (Left-Right)	98mm	
Power Supply	AC100-240V,50/60Hz,0.8-0.5A	
Power Consumption	107W	
Projection Lamp	12V 30W (Halogen Lamp)	
Solid-State LED Lamp	3.4V20mA	

Specifications are subject to change without notice for product improvement.



CNT-1

Non Contact Tonometer

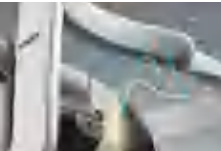
Angle Measurement Function via Touchscreen

Using the touchscreen, the ACA horizontal angle can be displayed in both graphical and numerical formats, making measurement easy. (CNT-1P)



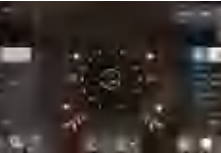
Automatic Adjustable Intelligent Air Jet Control System

Its intelligent function can be realized through customized intraocular pressure (IOP), as it can adjust the air-blowing pressure according to the patient's own intraocular pressure. The intelligent air-puff system automatically terminates once an accurate IOP signal is detected, maximizing patient comfort.



Automatic Tracking Guidance Prompt

Fully automated 3D tracking and focusing with intuitive animated feedback to guide the operator.. When the normal automatic tracking range is exceeded, it helps guide the necessary adjustments using the joystick and chin rest."



Visualization of Corneal Thickness Measurement

Real-time cross-sectional imaging allows for the simultaneous visualization and observation of bilateral corneal thickness.

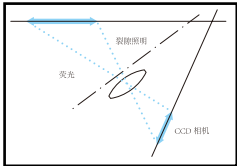


Accurate Corneal Thickness Compensation

Automatically calculates compensated IOP by factoring in the patient's corneal thickness for enhanced diagnostic accuracy.

CCT (Central Corneal Thickness) Measurement

Precise Central Corneal Thickness (CCT) measurement utilizing advanced fluorescence methodology. (CNT-1P)



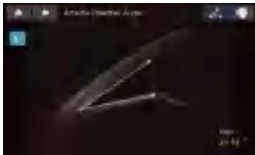
Electric Chin Rest

The easy-to-use electric chin rest allows operators to easily adjust the height of the chin rest.



ACA Anterior Chamber Angle Measurement

The ACA cross-sectional measurement function helps support the diagnosis of angle-closure surgery, which is one of the main causes of glaucoma. (CNT-1P)



Refractive Measurement

Type	Non-contact
Measurement Range	1~60mmHG
Measurement Step	1 mmHg (Average: 0.1 mmHg)
Measurement Modes	SPC30,SPC60,30,60
Working Distance	11 mm in front of the air jet hole
Data Interface	RS232C
Display	7-inch color TFT LCD touchscreen
Built-in Printer	Thermal printer
Power Supply	AC100-240V,50/60HZ

*Note: The design and specifications are subject to change without prior notice.



4in1 CTR-1A

Auto Ref/Keratometer, Non-contact Tono/Pachymeter

Corneal Topographer / Refractometer



Concept of Wavefront Technology /
Microlens Array

High-Order Wavefront Technology

Through Huvit z's proprietary wavefront analysis algorithm and microlens array technology, accurate and reliable refractive data can be provided. Practitioners can precisely monitor changes in spherical aberration both pre- and post-refractive surgery.

KER/REF Measurement

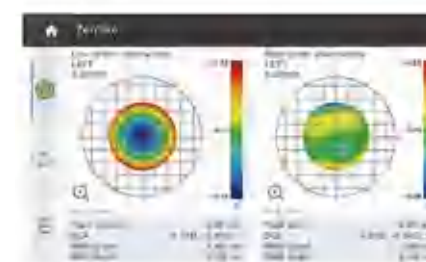
By using high-intensity light rings and bifocal LED light sources, and minimizing interference with accommodative ability, the error of REF measurement is reduced to the lowest level, ensuring high accuracy. Meanwhile, reliable corneal curvature data can be obtained.

Iris and Pupil Measurement

With the image capture function, users can measure the size of the iris and pupil, ranging from 2 mm to 14 mm.

Zernike Map for Customized Lens Reference

Generates detailed Zernike coefficient maps for comprehensive analysis of lower and higher-order aberrations, as well as overall corneal distortion.



Contact Lens Fitting Assistance

Provides simulated optical correction and automated evaluation for optimized contact lens fitting.

Automatic Radius of Curvature Calculation

Calculates the radius of curvature utilizing high-precision data points from both eyes.



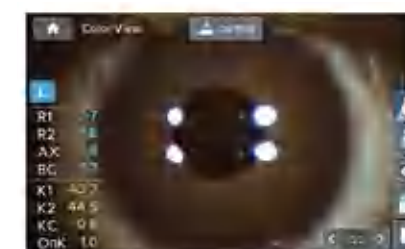
Retro-Illumination Mode

Captures retro-illumination images of the lens for clinical examination. Detects internal lens abnormalities and opacities, aiding in early cataract detection and contact lens evaluation.



Color View Mode

Provides more intuitive corneal topography and refraction prescriptions.



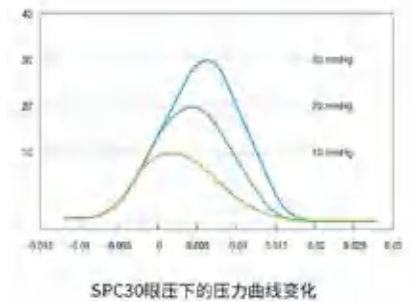
Tonometer / Pachymeter

One-Touch Fully Automatic Operation

CTR-1A supports fully automatic tracking and measurement. With one-touch operation, the device automatically tracks the pupil measurement point and calculates results.

Smart Air Puff Control

Delivers precise IOP measurements via a single, volume-controlled air puff for enhanced patient comfort.



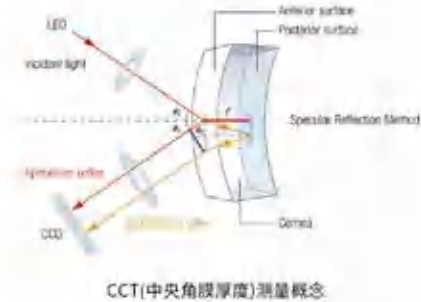
Compensated IOP

Calculates compensated IOP by integrating corneal thickness data for improved diagnostic reliability.



CCT (Central Corneal Thickness)

Utilizes advanced specular reflection technology for high-precision Central Corneal Thickness (CCT) assessment.



Flexible Joystick Adjustment

Flexible joystick and auto-alignment guidance allow accurate and effortless patient positioning.

High-Speed, Low-Noise Auto Printer

Prints up to 10 results within 2–3 seconds. Auto-cutting and one-touch printing functions enhance user convenience.



Tiltable 7-inch Color Touchscreen

High-resolution IPS display provides clearer imaging. Tiltable design allows easier note input and improved usability.



Compact Design

The space-saving compact design enables simultaneous IOP and CCT measurements without requiring patient repositioning.

SPECIFICATIONS

Refractive power measurement	Distance between vertex of cornea (VD)	0.0, 12.0, 13.75, 15.0		
	Spherical prescription (SPH)	-20.00 ~ +25.00 D (VD = 12 mm) (0.01/0.12/0.25 D unit)		
	Astigmatism prescription (CYL)	0.00 ~ ±12.00D (0.01/0.12/0.25 D unit)		
	Astigmatism axis angle (AX)	0 ~ 180° (1° unit)		
	Astigmatism indication	-, +, MIX		
	Pupil distance (PD)	10 ~ 85 mm		
	Minimum pupil diameter that can be measured	Ø2.0 mm		
	The accuracy specifications are based on the results of eye model testing preformed in accordance with ISO10342.			
Cornea curvature radius measurement	Corneal curvature radius	5.0 ~ 13.0 mm (0.01 mm unit)		
	Cornea refractive power	25.96D~67.50D (cornea equivalence' s refractive index: 1.3375) indication unit: 0.05/0.12/0.25D unit		
	Cornea astigmatism prescription	0.0 ~ -15.00 D (Increments: 0.05/0.12/0.25 D)		
	Cornea astigmatism axis angle	0 ~ 180° (1° / 5° unit)		
	Cornea diameter measurement	2.0 ~ 14.0 mm (0.1 mm unit)		
	Keratometry is in accordance with TypeB, ISO 103432014.			
IOP measurement	IOP range	1 ~ 60 mmHg SPC 30 / SPC 60, 30 / 60		
	Measurement increment	1 mmHg (Average : 0.1 mmHg)		
	Accuracy	±5.0 mmHg		
Corneal thickness measurement	CCT measurement range	300 ~ 800 μm		
	Measurement increment	1 μm		
	Accuracy	±10.0 μm (in case of The calibration Model eye)		
Wireless I/F	Protocol	IEEE802.11b 2.4GHz WiFi		
	Security mode	WPA2-PSK		
	IP configuration	DHCP mode		
Auto travel distance	Up and down	83 mm (±3 mm) : Total	RK Mode	40 mm (±5mm)
	Left and right	90 mm (±2 mm)		
	Front and back	40 mm (±2 mm)		
Automatic tracking scope	Up and down	± 5 mm		
	Left and right	± 5 mm		
	Front and back	± 5 mm		
Chin rest travel distance	Up and down	65 mm (±5 mm)		
Data memory	10 session worth of measurement values for each of the eyes on the left and right			
Interface	RS-232C			
	USB	Internal Software Update from PC (Engineer Only)		
	Ethernet			
	WiFi			
	Ext. VIDEO			
Hardware specs	Built-in printer	Thermoelectric line printer/Auto Cutting		
	power-saving function	Key power is blocked when the measurement is stopped up the set time. Recovered when pressing on the button or when the screen is touched.		
	Monitor	85° Tiltable 7" Color LCD IPS Panel (800*480) Resistive Touch panel		
	Dimensions	301(W) x 535(D) x 506(H) mm		
	Weight	23.8 Kg		
	Power supply	AC100-240, 50/60Hz, 0.6-0.9A, 144VA(Max.)		



CFC-1

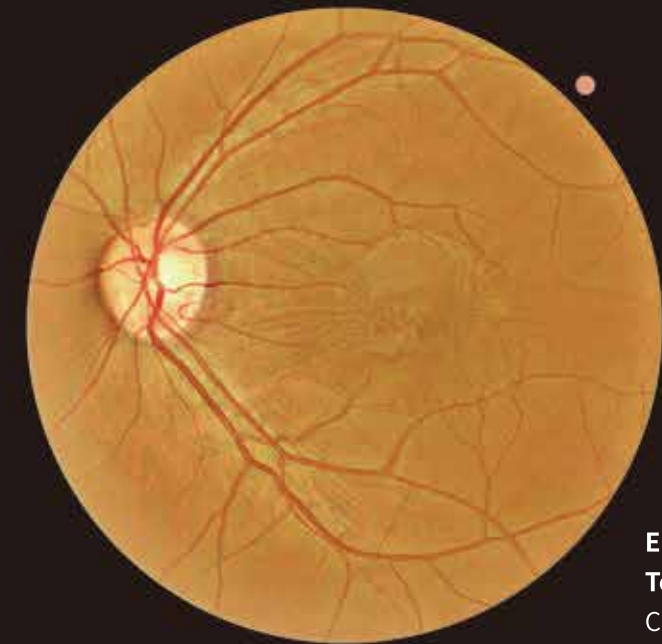
Non-Mydriatic Fundus Camera with Full Color Digital Image Acquisition

Foundational Precision: Charops Fundus Camera with Integrated PC for Rapid Analysis.

Featuring a 12.1" touchscreen and an integrated PC, the CFC-1 enables instantaneous image review and clinical analysis.

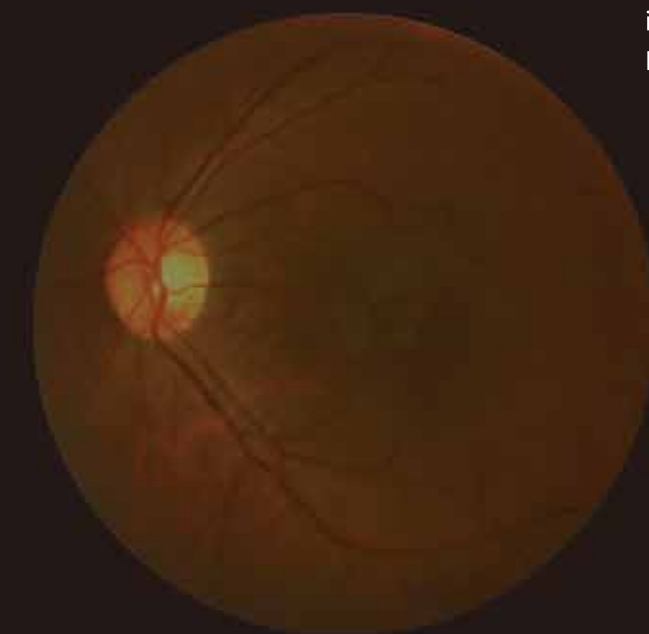
The CFC-1 captures high-resolution, full-spectrum retinal images to facilitate detailed lesion analysis and accurate clinical diagnosis.

Automated tracking and high-speed capture, combined with low-intensity flash, ensure maximum system stability and patient comfort.



Enhanced Visualization Technology (EVT):

Comparison of EVT-enhanced (top) versus standard (bottom) imaging for Epiretinal Membrane (ERM) detection.



Charops Fundus Camera for Quick View & Analysis - Integrated PC System with Enhanced Diagnostic Fundamentals

CFC-1 visualizes fine pathological variation by an innovative optical algorithm.

Camera of High Performance and Definition

The high-efficiency camera minimizes motion artifacts to capture high-resolution images, from wide-field overviews to detailed enlargements. Acquired images can be visualized by various image modes for further analysis and diagnosis.

A Variety of Image Modes

- Color : Brilliant & Full Spectrum Images
- Blue : RNFL, Wrinkles, Edema, Cell membrane
- Red : Pigmentary Abnormalities, Choroidal Rupture, Birthmark, Melanoma
- Red-Free : Glaucoma, Diabetic Retinopathy

CFC-1 enhances accuracy and certainty of diagnosis with high speed & utilitious analyzing functions.

Compact Design for Space Efficiency

With its compact design and built-in PC, measurement, analysis, diagnosis, and report generation can be performed at a single site. The CFC-1 is economically designed to save space.

12.1" LCD Touch Screen

CFC-1 offers high-quality resolution without afterimage due to real time imaging processing chip. The wide-color TFT LCD enables users to view high-resolution live images in real time. In addition, Touch screen increases user convenience.

Quick & Stable Auto Tracking & Auto Shooting

CFC-1 provides quick and stable Auto Tracking & Auto Shooting based on accurate Auto-detection technology. The system automatically detects and measures small pupils, eliminating the need for manual mode adjustments.

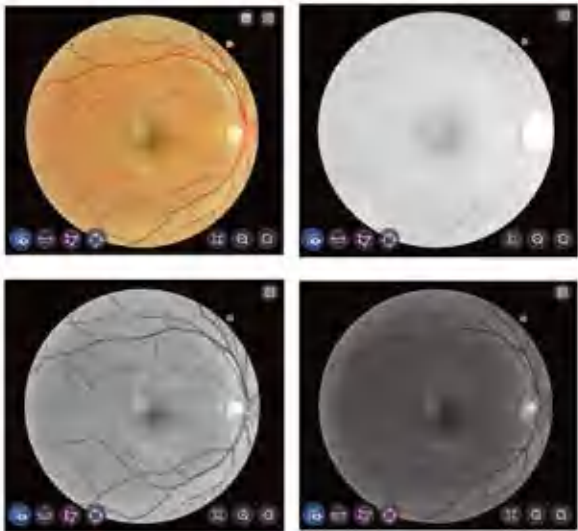


Enhanced Visualization Technology(EVT)

Enhanced Visualization Technology (EVT) is specifically designed to isolate and highlight subtle pathological variations.

Built-in Fixation Target

By adjusting the chart target position on the display, the user can obtain more accurate measurements.



Specifications

Type	Non-mydiatic fundus camera
Resolution	Center : 60 lines/mm or more Middle (r/2) : 40 lines/mm or more Middle (r) : 25 lines/mm or more
Angle of view	45°
Camera	Built-in 20Mega pixel, Color
Minimum pupil diameter	4.0mm (Normal mode), 3.3mm (Small pupil mode)
Flash light	White light, 10 levels
Pixel pitch at fundus	3.69um
Working distance	33mm
Display	12.1 inch, 1280x800 pixel, Touch panel color LCD
Dioptric compensation for patient's eye	-33D~ +33D total -33D~-7D with minus compensation lens -13D~ +13D with no compensation lens +7D~ +33D with plus compensation lens
Internal fixation target	LCD (internal), White LED (external)
Fundus illumination light	760nm
Horizontal movement	70mm (back and forth), 100mm (left and right)
Vertical movement	30mm
Chinrest movement	62mm (up and down), motorized
Auto tracking	30mm (up and down), 10mm (right and left), 10mm (back and forth)
Power supply	AC 100-240V, 50/60Hz, 1.6-0.7A
PC	Built-in computer
LCD Tilting angle	70°
External port	2 USB, 1 DP, 1 RGB, 2 LAN
Dimensions	330(W) x 542(D) x 521(H)mm
Mass	28kg

*Note: The design and specifications are subject to change without prior notice.



CBM-1

Optical Biometry with Full Corneal Topography System

OPTIMIZED CATARACT SURGERY WORKFLOW

Complete All 10 Examinations in One Step

Captures 10 essential biometry parameters for IOL power calculation; rapid acquisition significantly enhances patient comfort.

10 Measurement Parameters:

Axial Length (AL), Central Corneal Thickness (CCT), Lens Thickness (LT), Anterior Keratometry (Ker), Posterior Keratometry (Keratonus), Corneal Topography (Topo), Anterior Chamber Depth (ACD), Pupil Diameter, White-to-White Distance (WTW).



10 Measurement Parameters

IOL Power Calculation with Multiple Formulas

Clinical data integrates with advanced formulas to provide highly accurate IOL power recommendations.

Common formulas: Barrett Universal II, Universal II, Toric, True-K, Toric Rx, Haigis, CamellinCalossi, Shammas No History, Hoffer Q, Holladay, SRK/T.

Advanced IOL Prescription

Utilizing comprehensive diagnostic data, precise prescriptions for myopia and hyperopia are generated with maximum efficiency.



Advanced IOL Prescription

CBM-1 Provides Reliable Data and Corneal Information for Accurate IOL Power Calculation

Dense Cataract Mode (DCM) for Advanced Cataract Measurement

The Dense Cataract Mode (DCM) utilizes specialized algorithms to achieve accurate Axial Length and keratometry, even in advanced cataract cases.

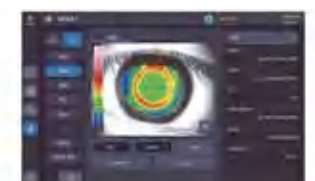


Dense Cataract Mode

Precise Corneal Information and K Values

CBM-1 provides accurate analysis and measurements of corneal structure, incision, refractive power, and elevation.

Corneal data includes: Corneal topography, anterior corneal surface, Zernike analysis, pupil diameter, corneal thickness, and white-to-white distance.



Topography Measurement



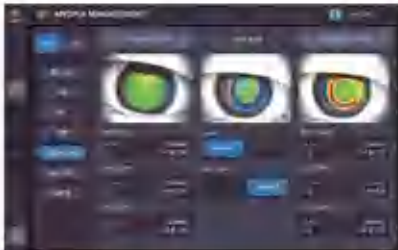
Map : Axial, Tangential, Refractive Power, Elevation

Myopia Management Functions

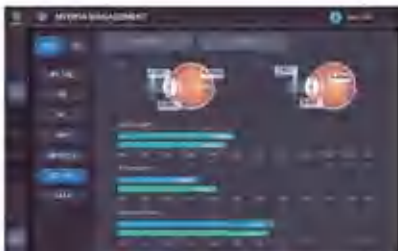
CBM-1 tracks and measures historical data, improving precision in AL and corneal change monitoring.



Myopia Management



Comparative analysis of corneal topography pre- and post-Orthokeratology (Ortho-K) lens wear.



Check Anisometropia

Automatic Tracking to Minimize Errors from Micro-Movements

Integrated auto-alignment ensures high-precision data capture by neutralizing measurement errors caused by patient micro-movements.

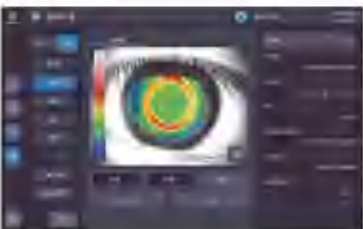
Contact Lens Fit Evaluation

Acquire accurate corneal data without the need to remove contact lenses.



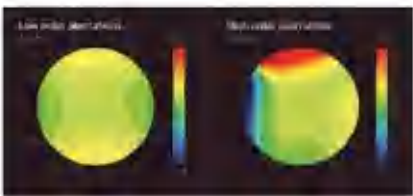
Early Keratoconus Prediction

Calculates Keratoconus Prediction Index (KPI) to evaluate keratoconus risk.



Zernike Analysis and Variables

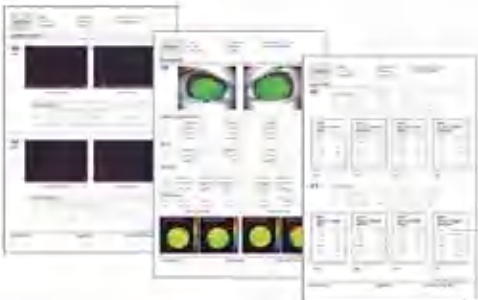
Systematic analysis of ocular optical variables, identifying optical power changes and irregular astigmatism.



Zernike Analysis

Evaluation Reports and Diagnostic Results

Generates comprehensive, intuitive IOL and corneal diagnostic reports with full DICOM compatibility for seamless EMR integration.



Report : Biometry, Topography, IOL

Specifications

Biometry

Parameter	Measuring range	SD of Repeatability
Axial length	14–40 mm	±0.025 mm
Anterior chamber depth	1.5–6.5 mm	±0.04 mm
Central corneal thickness	0.25–1.3 mm	±0.02 mm
Crystalline lens thickness	1.5–6.5 mm (phakic), 0.5–3.5 mm (pseudo-phakic)	±0.06 mm
White-to-white distance	7–14 mm	±0.05 mm
Pupil diameter	1–10mm	±0.05 mm

Keratometry

Parameter	Measuring range	SD of Repeatability
Corneal curvature radius	5–13 mm	±0.03 mm
Cornea refractive power	25.96 D–67.50 D (Cornea equivalence's refractive index : 1.3375)	-
Direction of principal meridians	1°–180°, Accuracy : according to the ISO 10343 : 2014	

Corneal Topography

Working distance	80 mm	
Placido disc	24 rings	
Measuring accuracy	Type A according to the ISO 19980 : 2012	
Cornea coverage	up to Ø 9,8 mm (on a 8 mm sphere) 42,20D with n=1.3375	

Other Parameters

Display Tilttable	10.1 inch, Touch panel color LCD	
Horizontal movement	45 mm (back and forth), 100 mm (left and right)	
Vertical movement	30 mm	
Chinrest movement	62 mm (up and down), motorized	
Auto tracking	X, Y for positioning, Z for working distance	
Power supply	AC 100–240 V, 50/60 Hz, 1.6–0.7 A	
PC	Built in computer	
Dimensions	302(W) x 506(D) x 510(H) mm	
Mass	22 kg	

Software Features

IOL	IOL calculator, IOL editor	
Keratoconus	KPI	
Contact lens fitting	Fluorescein simulation	
Zernike Analysis		
Myopia Management		

*Design and details can be changed without prior notice for improvements



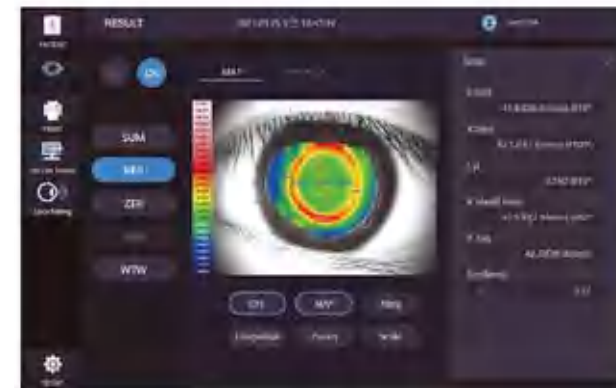


CTG-1

Full Corneal Topography System

Accurate corneal data measurement

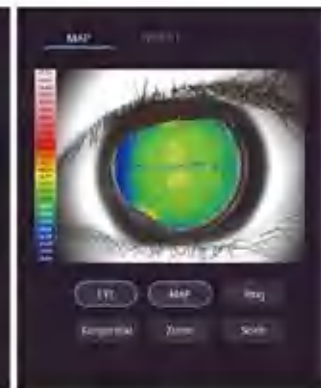
Utilizing advanced Placido disc technology, the system precisely captures comprehensive corneal data for specialized diagnostics including high-resolution Keratometry, Topography, Zernike Coefficient mapping, Pupillometry, and White-to-White (WTW) distance. Diagnostic results are visualized via multi-modal Axial, Tangential, Refractive Power, and Elevation maps. This data is essential for assessing corneal morphology, optimizing contact lens fitting, and surgical planning for cataract and refractive procedures.



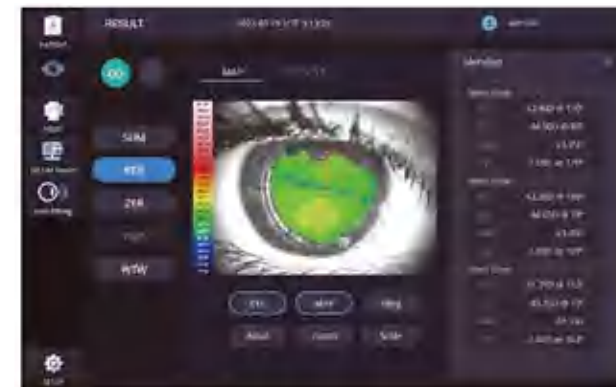
Simk



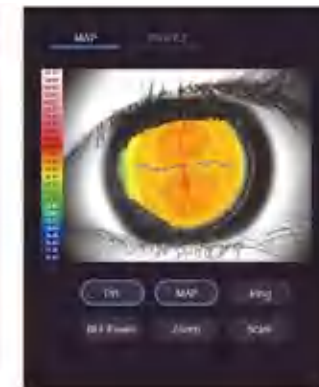
Map : Axial



Map : Tangential



Meridian



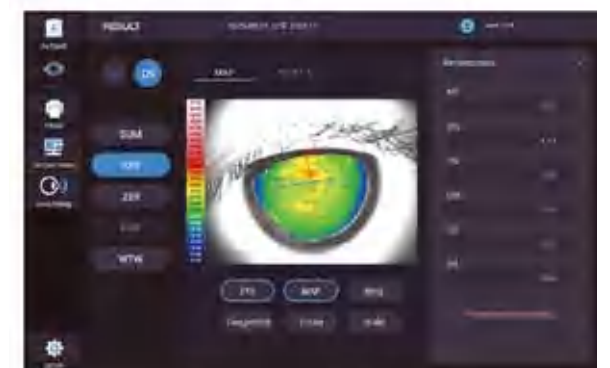
Map : Refractive Power



Map : Elevation

Early Detection and Clinical Prediction of Keratoconus

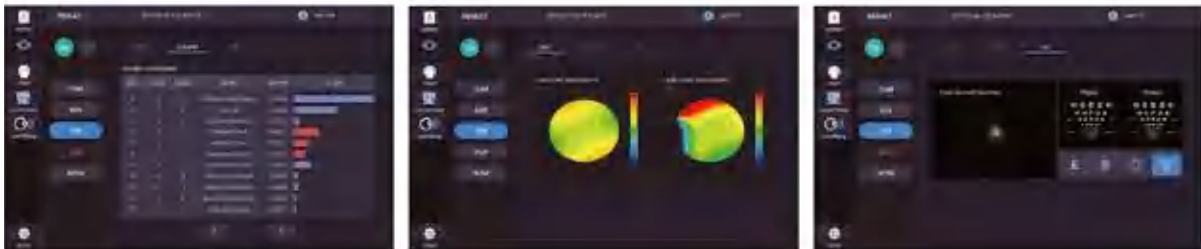
By analyzing anterior curvature, regional eccentricity, and convexity, the system calculates the KPI (Keratoconus Prediction Index) to assess ectasia risk. These analytics provide critical insights into keratoconus progression and support evidence-based clinical outcomes.



Keratoconus

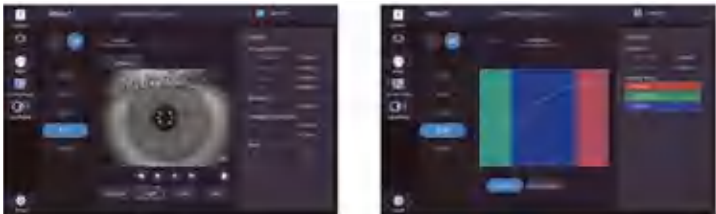
Zernike Analysis for a Range of parameters

Advanced Zernike Coefficient analysis quantifies refractive power variations, irregular astigmatism, and high-order aberrations.



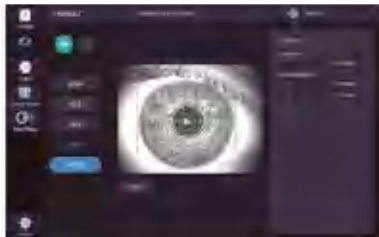
Pupillometry for Gathering Pupil Data

Dynamic Pupillometry evaluates pupil diameter and light reflex responsiveness across photopic, mesopic, and scotopic conditions. The results of these measurements are graphically displayed, including pupil diameter, maximum average pupil diameter, and average pupil diameter.



White to White Measurement

The CTG-1 provides automated White-to-White (WTW) measurements, essential for monitoring congenital glaucoma, surgical planning, and contact lens fitting. Measurement data can be easily adjusted and applied using the Edit function.



Contact Lens Fitting Simulator

Without having to directly inject fluorescent liquids, the integrated fitting simulator utilizes a digital Fluorescein filter to accurately model Hard and Soft contact lens performance.



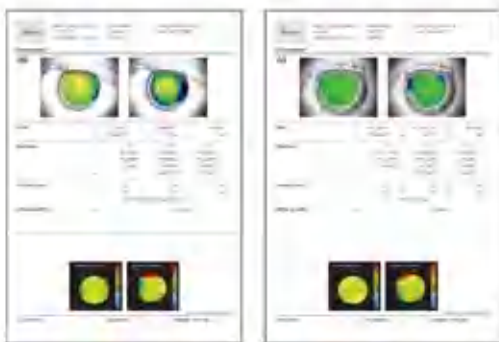
Contact Lens Fitting

Delivering Comprehensive and Reliable Diagnostic Reports

The system seamlessly integrates with clinical networks via standard DICOM protocols for centralized data management and reporting. It provides systematic reports for various parameters, including Topography, SimK, Meridian, Keratoconus, and White to White measurements, all derived from meticulously collected data.

Auto Tracking Mode

The auto-focus mechanism enables automatic tracking of measurement points, eliminating the need for manual focusing. This leads to faster and more accurate measurements, significantly reducing the hassle and difficulty.



Report

Specifications

Parameter	Measuring range	SD of Repeatability
Corneal curvature radius	3 – 38mm	±0.02 mm
Cornea refractive power	9D~112.5D (Cornea equivalence' s refractive index: 1.3375)	
Direction of principal meridians	Measuring range: 1° – 180° Accuracy: according to the ISO 10343:2014	
White-to-white distance	7 – 14mm	±0.05 mm
Pupil diameter	1.0 – 10mm	±0.05 mm
Working distance	80 mm	
Placido disc	24 rings	
Points Analyzed	Over 100,000 (Measured points: Over 6,220)	
Measuring accuracy	Type A according to the ISO 19980:2012	
Measuring range	up to Ø 9,8 mm (on a 8 mm sphere) 42,20D with n=1.3375	
Common		
Display	Tiltable 10.1 inch, Touch panel color LCD	
Horizontal movement	45 mm (back and forth), 100 mm (left and right)	
Vertical movement	30 mm	
Chinrest movement	62 mm (up and down), motorized	
Auto tracking	X,Y for positioning, Z for working distance	
Power supply	AC 100–240 V, 50/60 Hz, 1.6–0.7 A	
PC	Built in computer	
Dimensions	302(W) x 506(D) x 510(H) mm	
Mass	22 kg	
Software Features		
Keratoconus	KPI	
Contact lens fitting	Fluorescein simulation	
Zernike Analysis		

